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HUMAN SERUM AS A BLOOD
SUBSTITUTE

IN THE TREATMENT OF HEMORRHAGE
AND SHOCK

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The World War afforded an unusual opportunity to study and treat traumatic hemorrhage and shock. This resulted in a great impetus to the use of fluids intravenously for restoring normal fluid balance, combating hemorrhage and resultant shock, and aiding the treatment of wound septicemias and toxemias. At present infusions are also used widely for anemias, burns and dehydration due to various causes. Blood has been the fluid of choice in practically all conditions. However, on reflection it appears that blood may be replaced quite adequately in some circumstances. Thus, in severe infections serum (other than specific serum) may be used instead of blood if there is no associated secondary anemia. Traumatic and operative shock¹ and burns² are characterized by extensive plasma loss and hemoconcentration, resulting in a diminished volume and more viscid blood. It would seem that these conditions would be best relieved by serum or saline solution, which not only reestablish normal blood volume but also reconstitute normal plasma cell ratios. It is still believed that whole blood cannot be replaced in the infusion treatment for anemia, because of the need for red blood cells. It is likewise thought that severe hemorrhage, in which all the constituents of the blood are lost, can be treated only by the restoration of whole blood. Although whole blood is undeniably the ideal restorative fluid, the question may well be raised if it is the only fluid that can be used and if there may not be an adequate substitute which offers advantages over blood.

It may be stated briefly and categorically at this point that the loss of erythrocytes in severe hemorrhage is seldom a vital factor. The sudden and marked diminu-

tion in circulating blood volume is of grave and serious significance because this oligemia leads to rapid development of secondary shock as a result of anoxemia. All this is discussed more fully later. It is mentioned at this time only to bring out the important factors in severe hemorrhage, i.e. oligemia and ensuing secondary shock, and the vital necessity for prompt volume replacement to prevent or overcome the dangerous effects of hemorrhage. It is quite apparent that delay in instituting treatment is a serious matter, for the degree of shock increases and may become profound and irreversible.

All blood transfusions must be preceded by certain laboratory procedures: (1) typing the patient, (2) typing a proper donor, (3) careful testing for compatibility and (4) performing Kahn or similar tests. These procedures are essential in avoiding transfusion reactions and even when rapidly performed consume one or more hours, a delay which may prove fatal in an acute emergency in which the patient needs life restoring fluids immediately. Other fluids, such as dextrose and saline, may be given in the interim, but such interval measures are often ineffective. Hence a serious drawback in the use of blood transfusion as an emergency measure is a certain unavoidable delay of varying duration.³

It was this delay, in addition to other considerations such as frequent difficulty in securing blood for indigent patients, that led to the development and the use of "stored" or "preserved" blood. In an emergency the use of stored blood is an excellent measure, although evidence is accumulating that stored blood is inferior to fresh blood, especially if the storage has been for more than seventy-two hours.⁴ However, even with the use of stored blood there still remains unavoidable delay because of the necessity for typing the patient's blood, performing compatibility tests and filtering the stored blood. In addition, it has been recommended that such blood be administered slowly to decrease unfavorable reactions. For these reasons stored blood does not provide a solution for those emergencies in which prompt blood volume restoration is a vital necessity.

Reactions following blood transfusions are still relatively frequent.⁵ The most serious type of reactions is those due to hemagglutination or hemolysis.⁶ It is clear that although blood transfusion is a valuable measure and often life saving there are two handicaps that restrict its usefulness, i.e. unavoidable delay before

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1. Cannon, W. B.; Fraser, John, and Hooper, A. N.: Some Alterations in the Distribution and Character of the Blood in Shock and Hemorrhage, J. A. M. A. 70: 526 (Feb. 23) 1918.

2. Harkins, H. N.: Experimental Burns: The Rate of Fluid Shift and Its Relation to the Onset of Shock in Severe Burns, Arch. Surg. 31: 71 (July) 1935.

3. Hoitink, A. W. J. H.: Treatment of Acute Fatal Hemorrhage by Injection of Artificial Blood Substitutes, Surg., Gynec. & Obst. 61: 613 (Nov.) 1935.

4. Kolmer, J. A.: Preserved Citrated Blood "Banks" in Relation to Transfusion in Treatment of Disease with Special Reference to Immunologic Aspects, Am. J. M. Sc. 197: 442 (April) 1939.

5. Lundy, J. S.; Touhy, E. B., and Adams, R. C.: Data on Blood Transfusion in 1936, Proc. Staff Meet., Mayo Clin. 12: 225 (April 14) 1937. Levine and Katzin.

6. Levine, Philip, and Katzin, E. M.: A Survey of Blood Transfusion in America, J. A. M. A. 110: 1243 (April 16) 1938.

administration and reactions, both due primarily to the corpuscular elements of the blood.

The need for a good blood substitute is quite apparent and has been the subject of much investigation. The ideal substitute should be a fluid which is readily available, is stable over long periods of time, remains in the circulation and is devoid of reactions or ill effects.

Crystalloid solutions have played the most important role to date as blood substitutes. They are readily available, innocuous, economical and easily prepared. However, they are frequently ineffective because under certain conditions they leave the circulation. It was this fact which led to the use of colloidal solutions, such as acacia. Acacia is readily available and remains in the circulation, but its administration is accompanied by reactions and deleterious effects which militate against its use.⁷

The use of serum or plasma infusions for combating the effects of hemorrhage, considered as far back as 1918,⁸ has again been proposed in recent publications.⁹ Serum can be prepared for immediate use and large amounts of pooled serum can be administered without

EXPERIMENTS ON ACUTE HEMORRHAGE

Experiments were performed on anesthetized dogs (pentobarbital sodium) weighing from 13 to 22 Kg., in which blood pressure was recorded in the usual way. A femoral artery was prepared for bleeding and a femoral vein for infusions. After a control blood pressure had been recorded, the animal was bled rapidly until its blood pressure fell to shock level (systolic pressure of 40-60 mm. of mercury). The blood pressure was maintained at shock level for periods varying from ten to twenty minutes before an infusion of either saline solution or dog serum was given. The amount of fluid administered varied from one fourth to several times the amount of blood removed.

Eight such experiments were done, and all of them demonstrated superiority of blood serum over saline solution as an infusion medium following hemorrhage and shock in dogs. The results are best presented by means of protocols on two typical experiments:

EXPERIMENT 3.—Immediate reinfusion. A male dog weighing 21 Kg. was repeatedly bled and given immediate reinfusions until a total of 1,250 cc. of blood had been removed and 1,450 cc.

of saline solution had been administered. The blood pressure was never restored to a normal level (reduced by 30 mm. of mercury) although shock was effectively overcome. The subsequent administration of 200 cc. of serum elevated the blood pressure to its original height (from 110 to 140 mm. of mercury).

EXPERIMENT 7.—Delayed infusion. A male dog weighing 14 Kg., whose blood pressure at 1 p. m. was 146 mm. of mercury, had 425 cc. of blood removed rapidly, the pressure dropping to 40 mm.; at 1:50 the blood pressure was 60 but by 2:30 had fallen to 35 mm. Two hundred cc. of saline solution was then given and the blood pressure rose to 95 but thirty-seven minutes later had

dropped to 40. At 3:07 another 200 cc. of saline solution was infused, elevating the blood pressure to 80, but by 4 o'clock the blood pressure had again fallen to 40 mm. The animal was then given 220 cc. of serum and the pressure rose to 110-120 mm. and remained at this level until the termination of the experiment at 7:10 p. m. (fig. 1).

These experiments demonstrate that immediate infusion with saline solution following hemorrhage produces a moderate degree of recovery, which however is less marked than that following serum infusion. Delay in administering fluids, on the other hand, causes a loss of effectiveness of saline solution, the influence of which on blood pressure is only temporary, in contrast to the sustained effect of serum. Experiment 7 (fig. 1) demonstrates clearly this difference between serum and saline solution when a state of shock has been present for some time. The blood vessels apparently did not retain the crystalloid solution (saline), thereby nullifying the beneficial effects of volume replacement, whereas the colloidal solution (serum) was retained and maintained a normal blood pressure. These results fail to confirm Penfield's¹¹ experience.

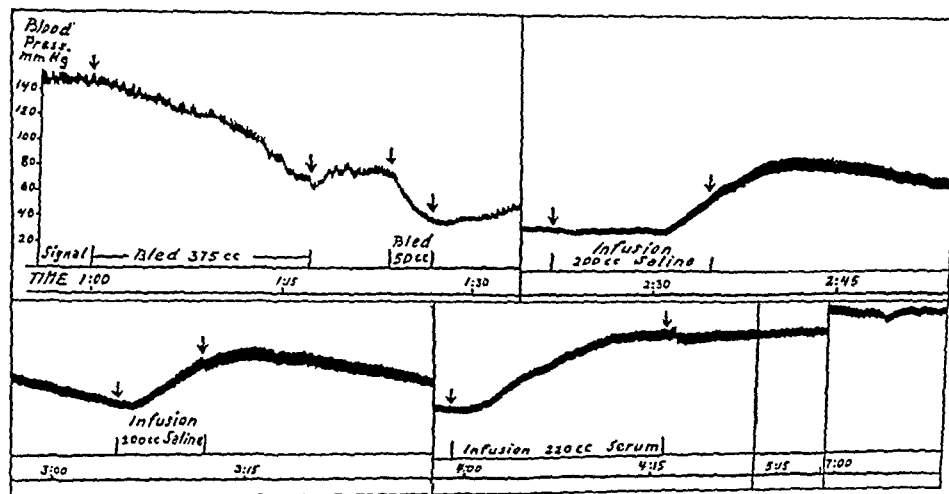


Fig. 1 (experiment 7).—Moderate and transient blood pressure elevation following saline infusion in contrast to sustained and marked elevation following serum infusion.

adverse reactions.¹⁰ This study was therefore undertaken to determine whether whole blood could not be replaced effectively by serum and how the latter compared with various crystalloid infusions in the treatment of hemorrhage and resultant shock. The dog was used because its physiologic behavior is similar to that of man in these conditions. Dog plasma forms fibrin clots or "veils" and becomes very cloudy. It was difficult to remove this material, for even after filtration there was a tendency for reformation of the fibrin veil. These fibrin particles and veils resembled the growth from bacterial contamination and required repeated sterility tests. Dog serum instead of plasma was employed, thereby avoiding these difficulties.

7. Studdiford, W. E.: Severe and Fatal Reactions Following the Intravenous Use of Gum Acacia Glucose Infusions, *Surg., Gynec. & Obst.* 64: 772 (April) 1937. Hall, W. K.: Effects of Intravenous Injections of Acacia on Certain Functions of the Liver, *Proc. Soc. Exper. Biol. & Med.* 35: 46 (Feb.) 1938.

8. Ross, Peyton, and Wilson, G. W.: Fluid Substitutes for Transfusion After Hemorrhage, *J. A. M. A.* 70: 219 (Jan. 26) 1918.

9. Kallius, H. U.: Experiments Concerning the Effects of Serum in Blood Transfusions, *Deutsche Ztschr. f. Chir.* 212: 289, 1939. Bond, D. D., and Wright, D. G.: Treatment of Hemorrhage and Traumatic Shock by the Intravenous Use of Lyophilic Serum, *Ann. Surg.* 107: 509 (April) 1938.

10. Levinson, S. O., and Cronheim, A.: Serum Inhibition of Hemagglutination and Its Significance in Transfusion of Blood and Serum, to be published.

11. Penfield, W. G.: The Treatment of Severe and Progressive Hemorrhage by Intravenous Injections, *Am. J. Physiol.* 48: 121 (Feb.) 1919.

HEMORRHAGE AND INFUSION IN
UNANESTHETIZED DOGS

Experimental Procedures.—The procedures are described in detail here because they were used in all further experiments. A considerable section of the right carotid artery was freed and the right jugular vein exposed aseptically under light ether anesthesia. Wide glass cannulas were inserted in both vessels. Three hours was then permitted to elapse to allow the effects of anesthesia to wear off. At the onset of each experiment pulse, respiration and temperature were recorded; blood pressure determinations were made by means of a Tyco anaeroid gage with a small T tube and rubber tubing connected to the carotid cannula on one side and to a citrate pressure bottle on the other. A determination of the circulating blood volume was made by the vital red dye method of Keith, Rowntree and Geraghty as described by Peters and Van Slyke;¹² arterial blood was drawn from the cannulated carotid artery for red blood cell count and hemoglobin as well as for determination of carbon dioxide, oxygen, chlorides, nonprotein nitrogen and plasma proteins. The animal was then bled until it was reduced to a state of shock as judged by blood pressure readings as well as by its clinical condition.

The animal was given infusions through the jugular vein of fluids at body temperature. At the end of each experiment the cannulas were removed, the wounds were dressed and the animal was returned to its cage. In some experiments chemical studies, blood count, hemoglobin and blood volume determinations were done on the following day or subsequently.

RESULTS

Massive Hemorrhage and Delayed Infusion.—Our aim in these experiments was to produce a state of post-hemorrhage shock by a single massive hemorrhage,¹³

leave the animal in this condition for two hours so that increased capillary permeability and secondary shock might develop, and then transfuse with various fluids. It was found that a number of animals recovered to a varying degree in the two hour period, while others remained in shock, and therefore transfusions with saline solution, serum or blood gave varying and inconsistent results. It is worth noting that those dogs having the highest blood pressures at the conclusion of the experiment had received either blood or serum. Another interesting feature was that the blood proteins remained at normal levels following serum infusions, whereas they showed considerable diminution after saline infusion. In one experiment with saline solution

the serum protein level fell to 3.6 per cent per hundred grams, a dangerously low level.

Graded Bleedings.—The method of massive hemorrhage and delayed infusion therapy having failed to produce a consistent and maintained shock simulating the condition frequently encountered in man, we resorted to another approach. A state of shock was induced gradually by repeated periodic bleeding and delayed subsequent infusions. During this process the blood reserves were so depleted that they played a less significant role in recovery and survival. The animals were prepared as described. Observations including pulse rate, respiratory rate, temperature, blood pressure, hematocrit, blood volume, red blood cell count, hemoglobin and chemical blood studies (nonprotein nitrogen, carbon dioxide, oxygen protein) were done at the beginning and at various intervals during the course of the experiments. Thirty per cent of the calculated circulating blood volume¹⁴ was then removed at the rate of 25 cc. per minute. The animal was put aside for

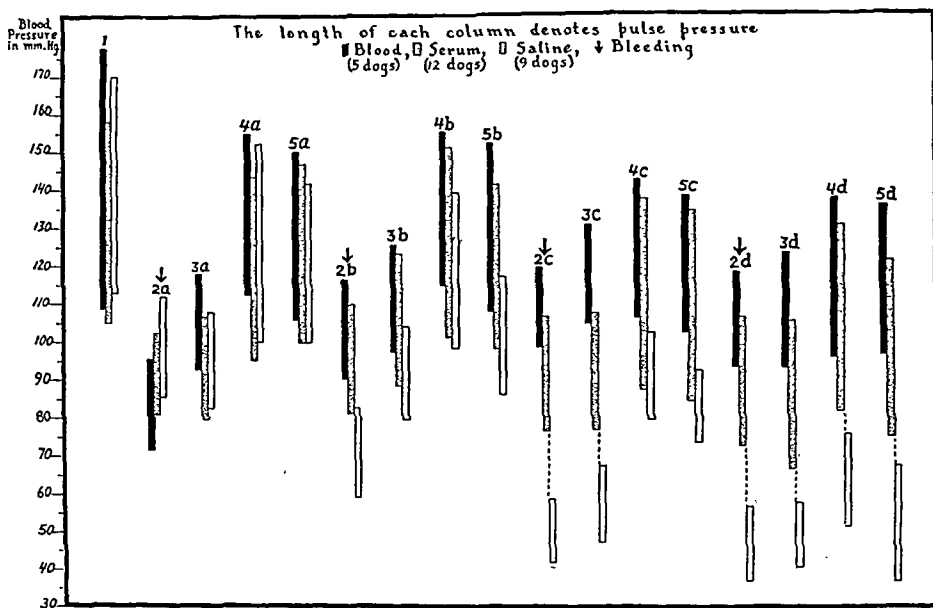


Fig. 2.—Maintenance of good blood pressure levels following blood and serum infusion in contrast to failing blood pressure following saline infusion: 1. Control before experiment. 2a. Immediately following first removal of blood, 30 per cent. 3a. One-half hour after first infusion. 4a. Immediately after first infusion. 5a. One-half hour after first infusion. 2b. Immediately following second bleeding, 20 per cent. 3b. One-half hour after second bleeding. 4b. Immediately after second infusion. 5b. One-half hour after second infusion. 2c. Immediately after third bleeding, 20 per cent. 3c. One-half hour after third bleeding. 4c. Immediately after third infusion. 5c. One-half hour after third infusion. 2d. Immediately after fourth bleeding, 10 per cent. 3d. One-half hour after fourth bleeding. 4d. Immediately after fourth infusion. 5d. One-half hour after fourth infusion. The blood pressures in the saline group do not include antemortem readings.

half an hour and then given an infusion, allowed to recover for another half hour and bled again. This procedure was repeated periodically until the animal had been bled of 80 per cent¹⁵ of the calculated circulating volume in successive stages of 30, 20, 20 and 10 per cent, and one half hour subsequent to each bleeding the dog was given an infusion of a quantity of fluid approximately equal to the blood previously removed. The amount of fluid infused did not replace the blood withdrawn for chemical studies, red counts and necessary washing out of cannulas (from 150 to 235 cc.)

12. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company 2: 706, 1932.

13. The blood removed varied from 2.5 to 4.8 per cent (average 4.0 per cent) of body weight.

14. The literature contains values for blood volume of dogs which vary from 7.5 to 11 per cent of the body weight (Gibson, J. G., 2d; Keeley, J. L., and Pijoan, Michel: The Blood Volume of Normal Dogs, Am. J. Physiol. 121: 800 [March] 1938). We arbitrarily chose the figure of 7.5 per cent of body weight as representing the circulating blood volume of the dog.

15. At each successive bleeding fewer red cells were lost, because of dilution from previous infusion. Actual cell volume removed therefore amounted not to 80 per cent but to about 66½ per cent of the initial circulating amount.

RESULTS

Twenty-eight experiments were performed. Five dogs were reinfused with their own citrated whole blood removed at preceding bleedings. Twelve animals were reinfused with serum from other dogs. Nine dogs were given saline infusions, four receiving physiologic solution of sodium chloride and five receiving Hartmann's solution, with or without 2 per cent dextrose. Two control experiments were performed in which no restorative fluids were given.¹⁶

TABLE 1.—Mortality Following Hemorrhage and Infusion

Infusion	Number of Experiments	Mortality After				Mortality	
		First Bleeding	Second Bleeding	Third Bleeding	Fourth Bleeding	Total	Per Cent
Control (untreated)...	2	0	1	1	..	2	100
Saline solution.....	4	0	0	1	3	4	100
Lactate (Hartmann's solution).....	5	0	1	2	2	5	100
Serum.....	12	0	0	0	0	0	0
Blood.....	5	0	0	0	0	0	0

Mortality (table 1).—We realized soon that this procedure of graded bleedings was the proper approach to study differences in the effects of the infusion fluids. All dogs that were bled four times, with removal of 80 per cent (30, 20, 20 and 10 per cent) of the calculated circulating blood volume and were given infusions either of whole blood or of blood serum, survived. Dogs given infusions either of saline solution or of Hartmann's solution died during the course of the experiment; one died after the second bleeding (50 per cent), three after the third bleeding (70 per cent), and the remaining five died from ten minutes to two and one-half hours after the second bleeding.

Blood Pressure (fig. 2).—In the beginning of the experiments the control blood pressures of all animals were approximately the same (1, fig. 2); they fell to a varying degree after the first bleeding (2a). A particularly low figure was obtained in a splenectomized dog. Marked variation in response to hemorrhage is to be expected on the basis of varying degrees of vasoconstriction, blood reserves and general condition of the animals. One-half hour after the first bleeding (3a) only seven of the dogs were suffering from various degrees of shock, their blood pressures ranging from 60/35 to 95/65 mm. of mercury. The first infusion was then given and the blood pressure rose to normal levels (4a) in all but four instances. In these, serum had been used and was followed by a "reaction" in which the blood pressure remained the same or was depressed to shock levels. This "reaction" was transient, occurred only after the first infusion of serum, and subsequent infusions of the same lot of serum gave no further unfavorable effect.

All the blood pressures were approximately normal half an hour after the first infusion (5a). From this point on, however, unmistakable differences began to appear between the different groups of animals. The most noticeable drop in blood pressure occurred in the saline animals following the second bleeding (2b). At this time the average blood pressure of the saline infused animals was 84/60, of the serum infused animals 111/83 and of the blood infused animals 118/92. After the half-hour post-bleeding interval (3b) the average blood pressures of the saline dogs was 101/81, of the serum dogs 125/90 and of the blood dogs 127/99. Figure 2

gives a graphic picture of the course of blood pressure as the experiments progressed. In the saline dogs the succeeding bleedings (2c and 2d) were followed by increasingly greater blood pressure drops and correspondingly less marked beneficial effects from the saline infusion. There was also a distinct tendency for the blood pressure to fall during the half hour post infusion recovery phase, an indication that the crystalloid infusion was of only temporary benefit. On the other hand, the serum and whole blood animals maintained good blood pressures throughout the course of the experiment, falling less during bleeding and showing good restorative response following infusion, indicating that serum and blood were retained in the circulation. At the end of the experiments the average blood pressures in those saline animals still alive was at shock levels, whereas the blood pressures of the blood and serum dogs, although reduced from their original levels, were quite satisfactory.

CHEMICAL DETERMINATIONS

Carbon Dioxide (table 2).—The control values for alkali reserve as reflected in arterial blood carbon dioxide was essentially the same in all animals and showed a uniform decrease after the first bleeding, reflecting the effect of the hemorrhage. The succeeding determinations showed a return to normal in the blood and serum dogs. In the five saline dogs that died before the end of the experiments a severe degree of acidosis was found terminally with carbon dioxide values as low as 4.5 volumes per cent. These observations led us to employ lactate saline solution (Hartmann) as an infusion fluid which might combat acidosis because of its buffering capacity. Table 2 shows that no such effect was obtained.

Blood Proteins (table 3).—The serum dogs showed practically no change in blood proteins. The blood dogs showed a definite drop in blood protein. An extreme fall was observed in the saline group, in which the plasma protein values fell from an average of 6.5 per cent to 3.8 per cent, a loss of 42 per cent of the initial

TABLE 2.—Changes in Arterial Carbon Dioxide Content Following Hemorrhage and Infusion

Infusion Fluid	Arterial Carbon Dioxide Content Before			
	First Bleeding	Second Bleeding	Third Bleeding	Fourth Bleeding
Blood.....	26.0	31.3	26.3	31.3
	29.0	33.7	28.1	29.5
	29.4	31.7	22.5	22.2
	37.3	32.1	32.5	25.7
Controls (untreated).....	38.4	25.1		

plasma protein. This decrease is significant, for it indicates that the lost protein was not replaced adequately from the tissue fluids. When the plasma protein falls below a critical level, even normal capillaries become permeable to their contents.¹⁷ Such an effect from lowered plasma proteins is much more marked in an animal which is acidotic and in shock.

Nonprotein Nitrogen.—There was no significant change in the nonprotein nitrogen values in the blood or serum groups, but there was a relative elevation in the saline dogs concomitant with their condition of shock.

Blood Volume.—Plasma volume showed little change in the blood and serum groups. Cell volumes dropped slightly in the blood group, markedly in the serum

16. For the sake of brevity, dogs infused with blood, serum and saline solution respectively are designated as "blood," "serum" and "saline" dogs or groups.

17. Leiter, Louis: Nephrosis, *Medicine* 10:135 (May) 1931.

group equivalent to the cells removed. The blood volume determinations in the saline group were unsatisfactory, owing to the fact that they were found to be inaccurate and unreliable in the presence of a state of shock.¹⁸

Red Blood Cell Count, Hemoglobin and Hematocrit.—The blood dogs showed a slight decrease at the end of the experiment. Both serum and saline dogs showed very marked falls, the change being more pronounced in the former group, in which it averaged about 50 per cent.

Respiration and Pulse.—Respiration was variable and influenced by unimportant external factors. The final pulse rates in the blood dogs were close to the

TABLE 3.—Changes in Plasma Protein Content Following Hemorrhage and Infusion

Infusion Fluid	Plasma Protein Content Before		
	First Bleeding	Third Bleeding	Fourth Bleeding
Blood.....	6.2	5.4	5.3
Serum.....	6.6	6.4	6.4
Saline solution and lactate.....	6.5	4.2	3.8

original rates. In the serum dogs the pulse rate was somewhat increased, but the saline dogs showed the most consistent and most marked acceleration.

SUMMARY OF EFFECT OF TRANSFUSION FLUIDS

Saline Solution.—The animals derived only partial, temporary and progressively diminishing restorative effects from this fluid. There were progressive fall in blood pressure, increasing acidosis, diminishing plasma protein, diminishing red blood cells and a progressive state of shock terminating in death in all instances.

Serum.—The benefits from this fluid were strikingly good and permanent. Blood pressures were well maintained, alkali reserve and plasma proteins remained normal, shock was effectively combated, and all animals survived. The red blood cells and the hemoglobin were markedly diminished, but no animals showed any serious effects from this anemia and their general condition was surprisingly good at the end of the experiment.

Blood.—This fluid was the best but aside from cell replacement was in most respects not superior to serum. The animals in this group all survived and showed only minor blood pressure decreases and weakness from the prolonged experiment.

LIMITS OF BLEEDING AND INFUSION

We were interested in determining to what extent animals could be bled and reinfused with serum and blood beyond the 80 per cent blood removal and replacement described. Two "whole blood" experiments were performed. In the first animal 140 per cent¹⁵ of the circulating blood volume was removed and reinfused. The final blood pressure was 125/115, compared with an initial pressure of 170/120; the alkali reserve, blood volume and hemoglobin remained relatively constant. The other animal was subjected to 150 per cent blood removal and replacement in stages; the final blood pressure was 125/95, while the original blood pressure had been 170/110. Alkali reserve, blood volume, and so on showed insignificant changes. Both dogs remained in good condition, although somewhat exhausted by the prolonged experiment.

While it is not remarkable that a dog can be repeatedly bled and reinfused with his own blood with complete recovery, the extent to which a dog can be bled when reinfused with blood serum is rather astonishing. Two dogs were bled and infused as usual until 80 per cent of the blood had been removed; then 10 per cent bleedings and reinfusions were continued until 110 per cent and 140 per cent¹⁵ of the blood had been removed before these animals died. Both animals were in fair condition until the last 10 per cent bleeding, following which the blood pressure fell markedly and the animals died before the next infusion period. The hemoglobin was reduced from 118 and 116 per cent to 25 and 24 per cent respectively and the arterial oxygen content fell proportionally; acidosis did not develop until terminally.

Similarly two other dogs were bled and given infusions of serum until 120 per cent¹⁵ of the calculated total blood volume had been removed. In one dog the blood pressure dropped with successive bleedings but rose following the serum infusions. At the end of the experiment the blood pressure was 95/50 and the animal was in fair condition. Hemoglobin fell from 138 per cent to 34 per cent and the pulse rate increased from 88 to 188 beats per minute. Blood carbon dioxide after the 110 per cent bleeding was 37.6 volumes per cent. The other dog had a blood pressure of 145/90 after the fourth infusion and the hemoglobin was reduced from 119 per cent to 63 per cent. The animal withstood four additional bleedings, at the conclusion of which the blood pressure was 115/60 and the hemoglobin 42 per cent. A total of 1,200 cc. of blood had been removed and replaced by an equal quantity of serum. Actually the loss of blood was somewhat higher, approximating a total of more than 1,400 cc. At the start of the experiment the animal's circulating blood volume as measured was 1,057 cc., with plasma volume of 624 cc. and a cell mass of 433 cc. Before the fourth bleeding, after 70 per cent removal of blood, although the plasma volume had remained constant, the cell mass had fallen to 160 cc., about 37 per cent of the original. The circulating cell mass at the conclusion of the experiment was much lower than the latter figure. Yet after such extensive removal of blood and depletion of red blood cells the dog was relatively strong and well, not acidotic and apparently little disturbed by his extreme anemia, for the pulse had increased only from 96 to 142 per minute. This experiment illustrates not only the restorative effect of serum but also the exceptional vitality of some dogs.

REACTIONS

The nature of the serum "reaction" mentioned, which was encountered in about 25 per cent of serum infusions, was of unusual character. The only constant sign of reaction was a moderate and transient drop of blood pressure, from which the animals always recovered spontaneously within the one half hour post infusion period. Further infusions of the same serum into the same animal never brought a repetition of this effect. Occasionally there were additional symptoms, such as chilling, growling, vomiting and defecation, which likewise were of transitory nature and did not recur on subsequent serum infusions. The same pool of serum would cause reactions in one animal and not in others. Compatibilities were performed in all instances, and only compatible serum was used. We were unable to establish a common causative factor, and this subject is now being further investigated with reference to sensitivity and other factors.

¹⁸ Neuwelt, Frank: Blood Volume in Shock, Am. J. Physiol. (Proc.) 126: 593, 1939.

COMMENT

Major attention in the past has been focused on the loss and need for restoration of red blood cells in acute hemorrhage. Rous and Turner,¹⁹ for instance, discarded the plasma and used the red blood cells suspended in Locke's solution. Experimental work and clinical experience by others and ourselves show, however, that a marked and rapid depletion of red blood cells is without fatal effect provided an adequate circulating blood volume and oxygen carrying capacity are maintained. The fatality accompanying or following acute hemorrhage is not due to loss of red cells per se but essentially to volume depletion, resultant inadequate circulation, tissue anoxemia, increased capillary permeability and shock (see Moon²⁰ for literature).

Acute severe hemorrhage produces oligemia, resultant lowered blood pressure and primary shock. The outcome of this primary shock depends on the rate and amount of hemorrhage and the availability of the blood reserves. Blood reserves vary in different animals, depending on their physical condition, and are considerable in the healthy animal. These reserves are mobilized promptly and fairly rapidly when needed; nevertheless, blood may be lost so much faster than mobilization can occur that this lag may prove fatal.²¹ When bleeding occurs slowly, adequate reserves will be mobilized and shock prevented.²²

These physiologic facts are well borne out in clinical experience in man. For example, a patient may have a slowly bleeding peptic ulcer but does not show evidence of shock as long as the blood reserves can compensate for the loss. However, sudden massive hemorrhage from ulcer, ectopic pregnancy or trauma results in oligemia and primary shock. The prime need in this event is to restore fluids and to maintain sufficient circulating blood volume. The actual composition of the fluid is of secondary importance. Hoitink³ has shown that the immediate infusion of large quantities of 0.9 per cent sodium chloride solution was as beneficial in saving the lives of dogs as any other blood substitute which he used, even though there was a profound diluting effect of the saline, reducing the concentration of red blood cells, plasma proteins and the colloid osmotic pressure.

If primary shock and oligemia are not relieved rapidly, tissue anoxemia, increased capillary permeability and acidosis, i. e. secondary shock, follow. Hoitink³ avoided this by immediate restorative measures. Secondary shock following hemorrhage presents an entirely different therapeutic problem than primary shock. Our experience has convinced us that in secondary shock saline solution is not the life saving fluid that it proves to be in primary shock because capillary permeability is increased. The experiments on anesthetized dogs demonstrated clearly that in secondary shock saline solution produced only moderate and transient elevation of blood pressure. Serum, on the other hand, produced a marked and sustained elevation of the blood pressure, indicating that the infused serum was retained in the circulation (fig. 1).

The experiments with graded hemorrhage and delayed infusion provided a method for demonstrating the striking difference between the value of crystalloid solutions and serum. The initial bleeding and the delay of reinfusion caused a slightly increased capillary permeability, permitting escape of the infused crystalloid solution. As successive bleedings were performed, capillary permeability in the saline infused animals increased progressively, with greater loss of the infused saline or dextrose solution and progressively diminishing circulating blood volume. In the serum dogs the capillary permeability was not sufficient to allow for escape of the infused serum, which remained in the circulation and maintained adequate plasma volume. Furthermore, while serum contains practically all plasma proteins, crystalloid solutions caused a dilution of plasma proteins with resultant lowering of the colloid osmotic pressure of the blood and transudation of saline solution into the tissues.^{22a}

Although whole blood is the best restorative fluid in massive hemorrhage, its use always entails an unavoidable delay which may be fatal. There is also the possibility of reactions despite the most scrupulous care. Furthermore, owing to the difficulty in obtaining donors, it is not customary to give quantities of blood larger than 1,000 cc. (except with the use of stored blood) despite the fact that the degree of hemorrhage may be sufficiently severe to warrant from two to three times this quantity.

Our experiments have demonstrated that serum overcomes all the effects of hemorrhage in dogs except the loss of red blood cells (this loss, as we have seen, may be quite extensive without serious effects). There are many practical advantages in the use of serum as a blood substitute. It may be prepared,²³ tested and stored in large quantities for long periods of time without deterioration. There is no need for any antibacterial preservative if the serum is carefully prepared under aseptic conditions and properly sealed against contamination. Pooling of serum partially suppresses the iso-agglutinins and there is further inhibition of iso-agglutinins by the patient's blood.¹⁰ Therefore, pooled serum may be given without any regard for blood groups and does not require preliminary typing and compatibility. This allows serum to be administered without delay. Serum after proper preparation requires no particular care (refrigeration temperatures for antibody preservation are of no concern), may be transported easily and can be handled and injected as simply as saline solution. If serum transfusion should prove to be as effective in treating hemorrhage and subsequent shock in man as it appears to be in the dog, it would be a valuable and effective blood substitute. The advantages enumerated, principally those of immediate availability and innocuousness, recommend its use. It overcomes all the effects of hemorrhage except the loss of red blood cells; it is obvious that this loss, when sufficiently great, requires ultimate replacement by whole blood. The use of serum, however, as an interval therapy, should prevent the development of shock. It should remove the need for "emergency" transfusions and the necessity for hasty blood typing and compatibility tests. Serum transfusions as an immediate and interval therapy should prevent or combat oligemia, shock, acidosis and the like, so that if blood is subse-

19. Rous, Peyton, and Turner, J. R.: The Preservation of Living Red Blood Cells in Vitro: II. The Transfusion of Kept Cells, *J. Exper. Med.* 23: 239 (Feb.) 1916.

20. Moon, V. H.: Shock and Related Capillary Phenomena, New York, Oxford Medical Publications, 1938.

21. Hooper, C. W.; Smith, H. P.; Belt, A. E., and Whipple, G. H.: Blood Volume Studies: I. Experimental Control of a Dye Blood Volume Method, *Am. J. Physiol.* 51: 205 (March) 1920.

22. Barcroft, Joseph: Physiology of Spleen, *J. Physiol.* 60: 443 (Oct.) 1925.

22a. Beard, J. W., and Blalock, Alfred: Intravenous Injections: A Study of the Composition of the Blood During Continuous Trauma to the Intestine When No Fluid Is Injected Continuously, *J. Clin. Investigation* 11: 249 (March) 1932.

23. Those institutions which have established "blood banks" may use the plasma from older, unused blood instead of discarding it.

quently administered it will be given to overcome secondary anemia rather than to treat the shock and collapse that is customarily encountered following massive hemorrhage. Furthermore, the necessary surgical treatment for the primary cause of hemorrhage may be instituted more promptly and is attended by more success when the patient is rapidly relieved from shock and is in good general condition.

There is urgent need for an effective blood substitute. Even in large hospitals and in large cities where blood can be secured with relative promptness there are situations in which immediate availability and injection of a good blood substitute would improve the therapy and enhance the prognosis. A greater need for a blood substitute exists in small institutions and small centers of population where there is greater delay and more difficulty in performing blood transfusions. Sterile flasks of serum could be kept on hand for an indefinite time and the serum could be promptly administered when a situation arises in which transfusion is urgently needed.

There were many publications and much research during and following the World War on the subject of blood substitutes because of the great need for such material at the battle front. Saline solution and acacia were used commonly although they were not satisfactory. Preserved red blood cells²⁴ were employed in a very limited way. "Preserved" or "refrigerated" blood rendered valuable service during the recent civil war in Spain, and this substitute for fresh blood is receiving prominent consideration²⁵ by the countries engaged in warfare at present. There are many drawbacks inherent in the use of refrigerated blood under front line conditions: the limited time blood can be kept before deterioration, the necessity for rapid transportation at refrigerator temperature, the necessity for care in transportation to minimize erythrocyte destruction from shaking, and lastly the necessity for typing and compatibility tests (unless only group O blood is used).

If serum is as effective in overcoming the effects of hemorrhage in man as it appears to be in dogs, then certainly it would provide the ideal substitute at the battle front. Since serum requires no particular care in handling and no preliminary testing and may be preserved for a long time, it can be processed in ample quantities from the blood of noncombatants in civilian centers far removed from the war front, prepared in proper containers ready for use and distributed directly to the front, where it can be stored until used. A wounded person who has lost much blood or is in shock can receive an injection of serum at a first aid station before he is transported to the base hospital, at which place, additional serum (or blood) can be administered. There is reason to believe from our experiments that such means, allowing for prompt volume restoration with a fluid retained in the circulation, would be a great factor in decreasing shock and mortality from wound trauma and hemorrhage. We have had the opportunity to employ pooled human serum in a limited number of cases of hemorrhage or shock. The effects from immediate human serum infusion on the blood pressure and general condition in these cases paralleled the beneficial results observed in our animal experiments. We expect to continue and amplify these clinical studies on human beings and we hope that others

will find this subject of sufficient interest and value to employ serum transfusions and to observe and report their results.

SUMMARY

1. Immediate restoration of fluid volume following extensive hemorrhage prevents the development of secondary shock.

2. Delay in restoration of fluid volume following extensive hemorrhage permits the development of secondary shock.

3. Crystalloid solutions are ineffective when secondary shock develops after severe hemorrhage.

4. Serum is an effective agent in combating all the effects of severe hemorrhage and resultant secondary shock except the loss of red blood cells.

5. Erythrocyte loss is not serious unless very extensive.

6. Whole blood, the best restorative agent, requires time consuming laboratory tests preliminary to administration, leading to an unavoidable delay counteracting its ultimate beneficial effects.

7. Serum may be given in massive amounts without any delay or preliminary testing.

8. Serum can be used as an interval measure preceding blood transfusions or as a substitute measure when blood is not available or when erythrocyte loss is not too extensive.

9. Human serum, as a blood substitute, should find wide use not only in civil emergencies but particularly in time of war at the battle front.

PRESENT DAY CONCEPTS OF CONVALESCENT CARE

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Realizing the importance of convalescent care and the necessity both of bringing this importance to the minds of the medical profession and of improving the quality of the small amount of institutional convalescent care available, the Public Health Committee of the New York Academy of Medicine formulated and published in 1925 a set of standards for convalescent care. A recent review of these standards brought about the realization that certain advances in knowledge of nutrition and of the adverse influence of various psychosomatic disturbances on restoration to health warranted a renewed study of the whole subject of convalescent care.

A two day symposium on the problem of convalescent care was held at the New York Academy of Medicine Nov. 9 and 10, 1939, under the joint auspices of the Committee on Public Health Relations of the academy and the Josiah Macy Jr. Foundation. At this conference some twenty papers were presented by distinguished physicians dealing both with the broad problems of convalescent care and with the special needs of patients recovering from particular illnesses.

My purpose in this paper is to organize and present this wealth of material so as to bring out in a relatively small compass the important points emphasized, and in the light of the information obtained to outline some program for the future.

24. Robertson, O. H.: Transfusion with Preserved Red Blood Cells, *Brit. M. J.* 1: 691 (June 22) 1918.

25. Use of Refrigerated Blood for Armies, Paris letter, *J. A. M. A.* 111: 1311 (Oct. 1) 1938.

The papers referred to in the footnotes are to be published by the New York Academy of Medicine in the Proceedings of the Conference on Convalescent Care.

Read before the Conference on Convalescent Care at the New York Academy of Medicine under the auspices of its Committee on Public Health Relations, Nov. 10, 1939.

THE PATIENT AS AN INDIVIDUAL PROBLEM

First, to touch on the inadequacies of the present situation, one may say that practically nowhere are the standards formulated fifteen years ago met at the present time. To put it tersely, the consensus at the conference was that in this country at least we are doing but little in the way of organized convalescent care and what we are doing we are doing, for the most part, very badly.

There are about 8,000 beds for convalescent care throughout the entire country. Four thousand of these are in the New York City metropolitan district, which leaves only 4,000 for more than 120,000,000 people.

The chief responsibility for the inadequacy of facilities and for the inadequacy of standards of convalescent care rests squarely on the medical profession.

It is a severe indictment of our profession that we as physicians, and particularly those of us who have the benefit of hospital practice and experience, are much more interested in disease than in patients. Adequate convalescent care requires interest in the needs of a patient as a person; we are interested in the patient as a case. The very phrase that interns use (and one rarely criticized) that "here is an interesting case of heart disease" rather than "here is a patient with an interesting heart disease" supports this point.

I admit that in large urban centers there may be some slight justification for this attitude. In large hospitals, particularly those with rapid turnover of patients, where most of the visiting staff do voluntary duty, there are so many pressing medical problems in connection with the large number of patients under their care that little time is left after attending to these needs for concern over the apparently secondary factors of after-care and the restoration of the patient to health, together with an inquiry into whether the environmental conditions to which the patient returns are conducive to the maintenance of health.

The knowledge that in such a vast majority of instances these environmental factors are hopeless of correction, and the lack of sufficient personnel in the social service department of many hospitals to make more than a few routine inquiries, bring an attitude of defeatism about doing much for the patient after discharge from the hospital. Yet the fact remains that disease, rather than the patient, is still the primary interest of most physicians, and one of the points most emphasized and reemphasized in the round table discussions was that no satisfactory results in convalescent care will be secured until there is general acceptance as a fundamental principle of the idea that in convalescent care attention must be focused on the patient as a person who has been ill and is recovering strength and has particular and individual problems to be considered in his course to recovery.

NUTRITION AND CONVALESCENCE

Another reason why even in our limited number of convalescent institutions we fail to do our best for these patients is that we still look on this period as one which presents merely an opportunity to obtain a rest interval before returning to home and work, and in which rest and diet are to a great extent carried out in a purely routine manner.

This is largely due to the fact that in the convalescent care, and even in the hospital care of many of our patients, we have failed to put into practical use the great increase in our knowledge during the past fifteen years in the field of nutrition and nutritive disturbances.

In his presentation, Dr. Kruse¹ has reviewed the tremendous increase during this period in our knowledge of the nutritive needs of the human being and of the various clinical syndromes which have been recognized as due to nutritive inadequacies of one or more essential factors, particularly in diet. It has become possible to postulate and determine a basic diet which will contain the essential elements in sufficient quantities of vitamins and minerals, apart from caloric requirements, necessary to produce a state of nutritive balance for an individual of given size, age and activity. Frequently, especially in the low-income group and in various diseases, the diet of the patient prior to his entering the hospital falls short of containing the minimum amount of the required essentials, so that the patient frequently arrives for treatment in a condition of nutritive inadequacy even though it be in a subclinical state. A further drain on nutrition may be produced by an episode of acute illness, during which frequently in the hospital no attempt is made to meet the nutritive requirements of the individual in respect to his particular disease process and his previous dietary inadequacy. Finally, in convalescence we usually place our patient on a routine diet which in no way takes into consideration his nutritive needs in respect to his previous dietary inadequacy or the nutritive depletion of his illness and then send him back in a state of serious negative nutritive imbalance to his home, where his diet may again be insufficient for his basic requirements.

In other words, in our convalescent homes we are still labeling our diets as "regular diet," "soft" or "solid diet" (according to their physical characteristics) or "cardiac diet" or "nephritic diet" or "convalescent ulcer diet" or "colitis diet," according to the disease from which the patient is convalescent, without any thought as to whether any of these diets are adequate to repair the nutritive deficiencies from which this or that individual patient may be suffering.

Again here you see the new thought in convalescent care, that the especial needs of the particular individual who is seeking to regain health, rather than the convalescent care of a case of pneumonia, or rheumatic fever, or appendicitis, is the thing of paramount importance.

PHYSIOLOGY AND PSYCHOLOGY OF CONVALESCENCE

Dr. Pepper,² in a paper covering the general problems of convalescence, regards the medical neglect of the convalescent state as due to the attitude, generally prevalent over many years, of attributing many remote phenomena of convalescence to psychologic causes. He challenges this as a theory accepted without sufficient supporting proof and states that the time has come to investigate the convalescent state scientifically to endeavor to discover whatever bodily or physical causes there may be for the phenomena of convalescence. The "convalescent state" is fallaciously assumed to be a single entity, produced by a common cause, exhibiting common phenomena and amenable to common management. In convalescence he declares, again emphasizing the need of studying the problem of the individual, that no two diseases—and I would add that frequently no two patients ill with the same disease—can possibly have the same state of bodily and psychologic conditions after the illness subsides and convalescence begins.

Certain diseases are known to produce physiologic and biochemical shifts from normal, and in a few dis-

1. Kruse, H. D.: Results of Recent Research in Nutrition, with Particular Reference to the Convalescent State.

2. Pepper, O. H. Perry: The Physiology and Psychology of Convalescence.

eases we know that this abnormality persists even after the acute phase of the illness has disappeared. This knowledge should challenge the medical profession to further study in other illnesses to ascertain whether there may not be much more evidence of disturbed physiologic, biochemical and nutritive processes in the convalescent state than has previously been suspected.

Even should we accept the fact, as some psychiatrists maintain, that a large proportion of the phenomena of convalescence arise in the mind rather than in the body, it may well be that many of these disturbances of psychology are dependent primarily on bodily dysfunctions.

It seems to me that this point of view is worthy of most careful consideration and respect. We know that the hyperthyroid patient is prone to psychologic and emotional imbalance; the diabetic patient in insulin shock can undergo the most profound personality disturbances; the exhaustion of childbirth, following the metabolic changes of pregnancy, may suddenly cause serious mental illness; physical and mental depression so often follow grip, and many patients at the onset of an acute illness are thrown into such an acute mental disorder that they are admitted to a psychiatric service, where only after examination their underlying illness is for the first time recognized. Moreover, psychic disturbances, after shock, trauma, and surgical operations, are well known.

Certainly, at any rate, if in convalescence there are persistent deviations from normal in metabolism, nutrition, body chemistry and physiology, restoration to health may well be expedited if attention is directed to correcting these abnormalities; and, again in this connection stressing the importance of the individual, not until we learn to recognize in each convalescent the actual abnormalities which persist from the preceding illness, and which differentiate that individual in convalescence from his condition in health, can we meet properly the therapeutic indications in his particular case.

PSYCHOSOMATIC FACTORS

From this discussion it is a natural transition to the consideration of the psychosomatic problems of convalescence presented by Dr. Robinson.³ By this time I am sure that the psychiatrists are saying to themselves "True, all these psychologic conditions you have touched on may be brought about by organic illness or disturbed somatic functions, but we say that they have occurred because these individuals have some psychologic or emotional dysfunction or maladjustment which has made them react in this particular manner." Well, I am not denying this, though to my mind objective proof sustaining this contention may be difficult to adduce; and while I maintain that every effort should be made to restore the normal physiologic, biochemical and nutritional balance in the individual during convalescence, I also willingly grant the desirability of exploring the question of the existence of psychologic factors in each convalescent patient which may retard recovery and of initiating steps which may resolve these problems.

The practical question immediately arises as to how much can be accomplished in the field of psychotherapy in the limited period of institutional convalescent care, even allowing for a much greater elasticity in the duration of stay of particular individuals than is permitted at present.

Dr. Robinson does admit that the psychosomatic disorders of the patient as a person may be given rather

scanty consideration during an acute illness and its convalescence, but he emphasizes that in chronic illness great attention must be paid to these factors. He makes a distinct contribution in showing the need of attacking these problems of psychologic disturbance as they arise in the course of chronic illness, a phase of treatment now greatly neglected. Where they are found in patients with chronic illness in convalescent institutions, they increase the duration of convalescence necessary to bring about a satisfactory adjustment. Also in this particular type of patient there arises the danger of increasing the patient's already strong feeling of willing dependence on the world in general and his resistance against facing life and developing a proper sense of personal responsibility. One other very important point made was that, after acute illness, convalescent care of a type which really restores the patient to health may well prevent the development of psychosomatic disorders which would be problems in later illnesses. Finally, the need was stressed of providing convalescent aid for the private patient of small means whose need for maintaining financial solvency frequently drives him to the resumption of his full activities all too early, and who is under much greater mental strain in his illness, as a result of anxiety over his expenses and possible loss of his job, than is the indigent patient in the hospital ward.

NEGLECTED OPPORTUNITIES

In the trend of this discussion there must have come to the minds of many still other opportunities heretofore neglected in convalescent care.

The first of these is the opportunity for the discovery and adjustment of environmental factors and family situations which may have contributed to the occurrence of the patient's illness and which may be militating factors against the preservation of health, once recovery is attained and the patient is back in his usual milieu. This is particularly useful for patients showing psychosomatic disorders, and emphasis is laid on the necessity of getting the cooperation of the relatives in helping the patient back to health.

Information having bearing on these conditions may have been obtained by the department of social service at the hospital during the patient's illness but only rarely are the results available to the authorities in the convalescent home. Too often nothing is attempted to alter these conditions for the benefit of the patient, and frankly all too frequently economic factors prevent the remedy of serious handicaps.

The fact remains, however, that at present in only a few instances are there two organizations, the hospital and the convalescent home, which are conjointly interested in the restoration of the individual to health, taking any cooperative measures to remedy conditions which may have been remote factors in the development of disease processes in an individual and which if uncorrected may continue to exert their baneful influence in undermining the health to which he has been restored.

The second opportunity is that of helping the patient during this period of rest and relaxation to evaluate himself, to take account of stock, to consider his habits of life and work in relation to their effect on his health, to judge whether both ends of the candle of life have been burning, and to determine whether certain dominating ambitions and tendencies are sufficiently important to strive for when measured against the nervous and bodily toll exacted; an opportunity to help him to

3. Robinson, G. Canby: Psychosomatic Factors in Convalescence.

develop a new philosophy and habit of life and work compatible with the reserves which age and illness have left him.

Unfortunately, in many of our convalescent groups it will be a case of "needs must when the devil drives"; but, even so, in general there is a golden opportunity here for sound work in health education which so far has been almost completely neglected.

So much then for what the conference has brought to our notice of the broader medical opportunities and requirements of convalescent care, together with the obvious deficiencies (apart from actual bed facilities) which at present exist.

SPECIAL NEEDS OF PATIENTS

Concurrent with these are the obvious recommendations which I shall briefly summarize at the end of my presentation, but before proceeding to that let us survey the special needs of patients suffering from certain types of disease and the general sense of the conference respecting these. Those which have been included for special consideration are the sufferers from cardiac diseases, renal disorders and infection of the urinary tract, gastrointestinal and respiratory ailments, cancer, postoperative hyperthyroid states, psychiatric disturbances, certain neurologic diseases, certain surgical operations and orthopedic conditions, as well as the recently delivered mother. There are also special requirements for children and the aged.

Obviously, to present the needs of any of these special groups in detail would take much more space than is available here. The outstanding fact disclosed in the discussion is that with the exception of the provision of convalescent care for patients with heart disease (and this to a very limited degree) none of the facilities available meet the medical problems involved; and here may be interpolated the interesting observation that in only one convalescent home serving New York City (that for cardiac children) is any scientific study being conducted to evaluate the efficacy of the methods employed.

In the opinion of the leaders in these fields, only by providing convalescent care in the setup of a convalescent hospital can the hope be entertained of restoring many of these patients to a reasonable state of health. This holds especially for most patients convalescent from the exacerbations of chronic illness, whose needs have been discussed by Dr. Boas,⁴ and presents a serious economic problem but one which must be faced and solved if we do not purpose to continue in the performance of pious gestures.

The psychiatric patient, for his cure, requires a prolonged stay in the sheltering atmosphere of a convalescent institution of the home type with expert psychiatric and nursing guidance. Thence he can make attempts at contact with the outside world, increasing the duration of these as his confidence and ability to adjust himself return, and thus lessening the likelihood of the repeated breaks to which many of these patients are subject.

Many neurologic and orthopedic patients can be restored to a fair degree of practical efficiency only by a prolonged period of care in an institution providing elaborate types of physical therapy carried out by competent technicians under expert medical supervision. A knowledge by physicians of the use of these modalities and of their potentiality when properly applied is all too rare today. With a knowledge of the results which

can be obtained in private practice in cases of hemiplegia, one can only speculate on how many helpless invalids with this disease who are now filling our wards might have been restored to a fair degree of functional efficiency by the employment of proper physical therapeutic measures earlier in the course of their disorder.

Patients suffering from renal disorders and other diseases and infections of the urinary tract are to be included among those who, in the opinion of Dr. McCann,⁵ need care in the convalescent hospital as opposed to the convalescent home. He stresses one important point in respect to infections of the urinary tract—namely, that these infections tend toward a state of latent chronicity, that the treatment in the hospital simply disposes of the acute exacerbation, and that in order to prevent relapse and recurrent hospital visits it is necessary to achieve sterilization of the urinary tract. This should be carried out during the period of convalescence and for its accomplishment requires the setup of complete urologic clinics and expert supervision such as can be obtained only under hospital conditions.

Discussion of the convalescent care of sufferers from prior hyperthyroidism and gastrointestinal disturbance emphasized the desirability of careful consideration and treatment of emotional and psychologic disorders which either were obviously manifest or else were potent factors in causing exacerbation of existing illness to the point of requiring hospitalization.

The necessity of obtaining satisfactory special diets in convalescence (at present not available) for sufferers from gastrointestinal disorders and the need of building up post-thyroidectomy patients were dwelt on, but nowhere did I note any special preoccupation with or interest in the fundamental nutritional needs or deficiencies of individuals convalescent from these various disorders, or any suggestion as how to cope with these problems as they arise in individual cases.

The newly delivered woman is at present greatly neglected. Although it is well known that the normal involution of parturient organs takes at least eight weeks, most women are forced to resume the burden of household cares within two weeks of their delivery. Of the slender opportunities available for giving them help during this period, not one is satisfactory. The home which receives the mother alone is entirely unsatisfactory except for the woman who cannot nurse her child, as it means compulsory weaning. Homes which take both mother and infant present the grave danger of nursery cross infection unless nursing techniques, professional standards and supervision are so high as to be prohibitive in cost. Furthermore, few mothers will be found willing to leave their families for this additional period. For this reason housekeeping aides are needed, but their training at present is inadequate. However, the potential possibilities in this form of assistance are great, and economically it is the cheapest form of aid. Apart from the practical means of easing the mother back gradually into full family responsibilities, unrivaled opportunities exist for instruction in household management, dietetics, cooking technique, child care. In brief, here is an opportunity for extensive health education as applied to a family unit.

No point of view of convalescent care for the mother is satisfactory which does not take into account health of the infant as well. No one thing probably contributes so certainly to the maintenance of her

4. Boas, Ernst P.: Convalescence and Chronic Illness.

5. McCann, William S.: Convalescent Hospital Care of Patients Diseases of the Kidneys and Urinary Passages.

in the first few months of an infant's life as breast feeding. Much more should be done at present in encouraging mothers to wish to nurse their infants for expediting the involution of their own pelvic organs, for the infant's physical condition and, as Dr. Powers⁶ points out, for establishing a proper emotional relationship between child and mother. Much more should be done to educate the mother in the value of nursing in promoting this relationship and how after leaving the hospital she may so live and eat as to insure an adequate supply of her own milk.

One of the discussions which showed an important and salutary advance in thought was that on the broad question of institutional convalescent care for surgical patients. Dr. Ravdin⁷ says that no longer is the operation considered "the major part of surgical therapeutics." What a far cry from the days of my own internship, when frequently the first introduction of the operating surgeon to the patient was when he saw him anesthetized on the operating table and incised him to see whether the house surgeon's diagnosis was correct. Dr. Ravdin's thought follows so closely the trend of those which I have been unfolding, and he expresses it so well, that I feel that it can best be presented in his own language:

The patient with a gastric ulcer becomes John Jones who has a gastric ulcer. Each patient before and after operation becomes an individual problem, and this provides a closer relationship between the surgeon and his associates and the patient.

Again, listen to this:

The past emphasis on the economic values of convalescent care naturally had as its outcome a lack of intelligent interest in the planning of the institution for convalescence, and there are few quantitative studies available from which we may draw information as to the value of such care and the type of organization most suited to provide transitional medical and surgical treatment. It is to be hoped that this conference may bring forward for discussion the requirements from the medical and surgical points of view and point out the value of carefully controlled studies during the convalescent period.

Another practical and worth-while suggestion which the surgeons made was that of utilizing convalescent institutions for preoperative treatment of persons who need building up into a state of nutritive balance—a sort of convalescence-in-reverse process which would improve operative results and shorten the postoperative convalescent period.

There is a generally growing feeling that in order adequately to restore back to health patients who present difficult problems requiring special apparatus and technics and for whom convalescent care will be prolonged it will be necessary to develop institutions in which there will be a close and even interlocking relationship between the professional staffs of the hospital and the convalescent institution to which the patients are referred.

I regret that the lack of a background of practical clinical experience in the field of pediatrics renders me unable to summarize Dr. Nelson's⁸ paper with the insight and interpretative ability it deserves. One may say, however, that in the case of children convalescing from various types of disease one faces the same need of special facilities, technics and equipment as in that of adults. For others who require more simple care the foster home has not been sufficiently utilized.

Dr. Nelson pointed out that so-called malnutrition cases (most of which were considered environmental in origin) did not hold gains made in convalescent institutions and that a feeling against accepting them was growing. In the discussion it was brought out that in one institution the inauguration of a home visiting nurse service to educate the parents of these children in their dietary needs and in proper selection of their food was found to produce a marked decrease in the incidence of relapse.

At the other end of the life span Dr. Lewellys F. Barker,⁹ who presented the needs of the aged and the special problems arising in their convalescent care, lays emphasis on the increasing importance of the convalescent care of the aged by indicating that in 1930 there were in this country about 12,000,000 children under 5 years of age and some 6,500,000 individuals over 65 years of age. However, with the diminishing birth rate and the prolongation of the life span it is probable that by 1975 there will not be more than 6,500,000 children of the age group just mentioned but there may be 30,000,000 individuals over the age of 60 and some 22,000,000 over the age of 65. This emphasis is particularly made with reference to the fact that even now, with our relatively small number of beds for convalescent patients, a considerable proportion of them are exclusively for children. He calls attention to the marked nutritional deficiencies in aged convalescents, vitamin, mineral and hormone, as well as actual impairment of body weight. These individuals with depleted reserve powers, lowered processes of assimilation, sluggish bodily response and the difficulty often of inducing an adequate food intake make the problem of rebuilding extraordinarily difficult. Added to this is the fact that few physicians are expert or even interested in geriatrics.

There are further difficulties encountered on the side of personality in handling older people; they are apt to be "crochety"; they have fixed habits, dislike change and often are childishly unreasonable. People in this age group are more apt to make satisfactory progress if segregated in convalescent wards or homes than when cared for in mixed age groups. He also feels that the younger group in the profession may not be so readily able to understand and handle these individuals as those with greater maturity and experience and riper judgment. This impression does not coincide with my own observation and experience. I agree that the young are often intolerant of the aged in their own home circle, but I think that old people frequently prefer having young physicians take care of them. They find them willing to give more time and to be less impatient with their whims and vagaries and prolixities. They feel that they are important and can boss the young doctor, who usually gains his point by circumvention or wheedling, a time-consuming process which the busy physician's practice does not permit. He also brings out one excellent point, and one which is very important for relatives of aged patients to recognize. After an episode of illness they should not be wrapped in cotton wool, hedged with restrictions and deprived of independence. Every effort should be made to keep them interested in life and with a feeling of importance in their new circle. Nothing hastens the aging process or causes a faster disintegration of personality than the feeling that one's usefulness is past and that one is ready for the junk pile.

6. Powers, Grover F.: Discussion of the Convalescent Care of Children.

7. Ravdin, I. S.: Institutional Convalescent Care for Surgical Patients.

8. Nelson, Waldo E.: The Convalescent Care of Children.

9. Barker, Lewellys F.: Convalescence of Old-Age Patients.

These then are the more important general and special problems which were brought to light during the conference. In parading these skeleton facts I hope that at least some of the shreds of the spirit of the conference which clothed them may be conveyed by means of this summary.

FURTHER QUESTIONS

The next questions are what to do, where to go, how to plan. The burden of responsibility for formulating the answers to these questions should be laid on the table of another conference, and I am sure that it will take more than one such conference before practical working agreements are reached. As an ultimate goal one may offer the following. It will be reached only after a period of many years, during which we shall have to put up with many expedients and makeshifts as we change our objective.

Apart from the quantitative increase in facilities which ultimately will be provided, we must face the fact that to accomplish the ends we are seeking we also ultimately, with few exceptions, must scrap completely the type of organization under which our convalescent institutions at present operate.

We must face the fact that to restore these patients to health we cannot depend on their casual supervision by a general practitioner in the neighborhood. We cannot let the choice of a matron-in-charge depend on the financial embarrassment of some widowed gentlewoman who is a social acquaintance of wealthy members on the board of trustees.

Each institution should have a full-time medical head, free from administrative duties, well grounded in the new knowledge of the biochemical, physiologic and nutritive disturbances which occur in illness and persist in convalescence. In addition he should have a fair understanding of the psychologic disturbances which his patient may show, and some knowledge of the techniques for the correction of these.

If such a paragon does not exist we shall have to develop him or, more likely, we may find that we shall have to have a second physician who will devote himself exclusively to the psychologic problems of the individual patient. These two men should not be so narrowly trained that their points of view are mutually antagonistic, a condition of mind today which is rather prevalent. In addition an expert dietitian trained in the modern knowledge of nutritive requirements is necessary, as well as nursing personnel, the type and number of which will be determined by the types of disease which the institution receives.

This implies an overhead expenditure which will not justify a bed capacity below a certain minimum, which will be gradually determined by experience.

In order to apply our more recent knowledge for the benefit of the convalescent patient, convalescent homes will have to receive from hospitals regarding all patients referred much more detailed reports as to their medical condition on discharge and also medical social workers' reports, which will stress those economic and environmental factors which may have been predisposing causes for their breakdown and which may militate against health maintenance when the patients return home. In connection with this it is interesting to note that the reference cards now in use in New York City contain the large space of one and a half lines for all medical and social information.

Gradually there should be developed more and more convalescent institutions, offering facilities usually found only in a hospital, for a clinical check-up on

patients recovering from certain types of disease and in these institutions also must be installed considerable equipment, especially in the field of physical therapy. This, of course, presupposes the inclusion in the personnel of technicians capable of handling these modalities and a medical man with a knowledge of their indications.

Eventually, I can also foresee that the realization will come that for patients recuperating from certain diseases a close interrelationship between the hospital and the convalescent institution will be found desirable and that members of the attending hospital staff will receive periodic assignments to duty at the convalescent institution. It is interesting to note that in a few instances this is already an accomplished fact.

In view of this possibility, the location of convalescent institutions in respect to their distance from hospitals must be given consideration. With the realization that other factors in the treatment of convalescence may be as important as rest, fresh air and sunshine, a plan recently developed by Commissioner Goldwater may present great potentialities. He has planned to convert the roofs of two of the tuberculosis hospitals now under construction into day camps where patients after their discharge may return to spend the day for periods to be determined by the hospital staff. The possibility of extending this form of convalescent care to other types of patients in other hospitals, where practical, might provide at minimum expense a satisfactory setup for patients still in need of hospital facilities for investigation and treatment where they would be under daily supervision by the same hospital staff as they were during the acute phase of their illness.

Convalescent care for the recently delivered woman should be broadened. The housekeeper service should be greatly extended and some plan should be evolved, in connection with this service, whereby these activities may be used as a demonstration to the mother and family of how to carry out household duties more efficiently and economically, and whereby during this period they may be fitted into a program of health education for the family unit.

Finally, if we are not to go blundering on, certain convalescent institutions should be selected as experimental stations in which, through study, we may increase our knowledge concerning the biochemical, physiologic, nutritive and psychosomatic problems of the convalescent state. In these institutions, scientifically controlled methods of treatment should be evaluated by careful analysis of the results obtained.

This field is practically unexplored. The time necessary for such investigation to be of proved value would cover a period of years, and the cost would be considerable. To finance such studies would be one of the greatest contributions to health preservation and disease prevention that foundations could make.

The program just presented is idealistic, but unless we strive for the ideal we shall remain glued in the morass in which we have been fixed these many years. If the type of convalescent care advocated is deemed impractical, it is largely because of its economic implications. However, which is the more expensive, hospital care or convalescent care? Don't we admit that a lot of hospitalization results from failure to restore patients to health after previous illness? Isn't it likely that with more convalescent care of the right kind less hospital care will eventually result? What will be the balance of expenditure between the two? Who knows? There may be no total increase.

But with a setup of convalescent care which is sound medically and which we feel sure will accomplish what convalescent care is supposed to accomplish and which it now fails to do, and which will cause a broad increase in health and the happiness of living, who can say that it is utopian? In the light of our present vast expenditures on human suffering, should we not strive for this ideal, through which, by handling our problems of convalescence in an intelligent and scientific manner, much of this human suffering may be prevented and much of the expenditure for it eliminated?

AORTIC REGURGITATION AND MITRAL STENOSIS IN A MARATHON RUNNER

WITH SPECIAL REFERENCE TO THE EFFECTS OF VALVULAR HEART DISEASE ON PHYSICAL EFFICIENCY

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At the compulsory medical examination of competitors in the marathon race at the Royal Scottish Gathering in Johannesburg, South Africa, in 1935, competitor G. M., aged 32, was found on cursory examination to have both systolic and diastolic murmurs over the apex and base of the heart and a diffuse and markedly forcible impulse.

It appeared to us that these abnormalities constituted sufficient reason to advise him against participation in the race. He stated, however, that as he had competed in similar races on many occasions in the past without ill effects he saw no reason why he should not run, and consequently he did not follow our advice. On the day the marathon race took place the weather was extremely warm and our subject was one of the four who completed the race out of a field of seventeen. His time for the race, approximately 26 miles, was three hours and two minutes, which under the circumstances of the intense heat and of the altitude (approximately 6,000 feet above sea level) represented a performance of international standard. His condition after the race was surprisingly good and his recovery time was short as compared with that of the other competitors.

As this case appeared to us extraordinary, it was decided to investigate the subject further. Clinical investigations, supplemented by electrocardiographic and roentgenologic studies, were carried out over a period of four years. On several occasions, observations were made before and immediately after long distance runs. Our observations are here presented.

REPORT OF CASE

History.—G. M. is a carpenter. He states that during childhood he was very weak and that because of rickets he could walk only with the aid of metal supports. He suffered from the usual childhood diseases, such as measles, scarlet fever and whooping cough. At the age of 9 years he contracted a severe illness which, although he says it was thought to be typhoid, seems more likely to us to have been rheumatic fever, because at the time his joints were swollen and painful and the

physician believed that his heart was affected. It is also alleged that in the course of this illness he contracted pneumonia. In the following years he suffered from various complaints such as headache, biliousness, palpitations, vomiting and other minor ailments. He was, as he stated, a "cripple." At the age of 16 he was readmitted to the hospital, this time for treatment of "intestinal trouble," the nature of which he is unable to state. Shortly afterward, bilharziasis was diagnosed after he had passed blood in the urine for a considerable period. After approximately fifty injections of antimony and potassium tartrate the bilharziasis was cured. At the age of 19 he suddenly fell ill again with a high temperature and rigors. He did not regain full strength, but in spite of his poor condition, after persuasion by his friends, he decided to play rugby for his club on one occasion. After this game he collapsed and was taken in an unconscious state to a hospital. There his condition was regarded as so alarming as to warrant sending for his parents. He remembers neither the collapse nor the subsequent hospital treatment. According to his statements his joints, particularly the knees, were swollen, his temperature was 104 F. and his pulse was regular but slow. Only after having spent four months in bed could he walk again.

His legs were atrophied to such an extent that he could walk only with the aid of crutches. Shortly afterward he contracted malaria, with repeated attacks of rigor and fever, which were treated successfully with quinine and brandy. At the age of 25 he was the victim of a motor car smashup in which he received severe burns over the chest and, in addition, his right knee joint was pierced by a fragment of metal, later to be removed surgically. A short time afterward he underwent an operation for inguinal hernia, since which time he has remained in good health.

Athletic History.—Since 1932 he has undergone a hard and systematic athletic training. He has been remarkably successful as a long distance runner, having participated in fourteen marathon races, always completing the distance. He won the South African Marathon elimination race for the British Empire Games in 1934 in two hours and fifty-four minutes (distance approximately 26 miles). On two occasions he entered the annual 54 mile race from Durban to Pietermaritzburg and covered the distance in good time, his record for this race being eight hours twenty minutes. On numerous occasions he has run from Johannesburg to Pretoria, a distance of 36 miles. During the past two years his athletic performances have further improved; in September 1937 he competed successfully in two marathon races within eight days. At the time of writing (1939) his physical condition continues to be excellent and he is still racing regularly in competitive events as well as frequently running long distances at his own leisure. Recently he has commenced playing squash raquets and is now one of the most prominent players in Johannesburg.

Physical Examination.—The subject is tall and thin. His height is 5 feet 10 inches (178 cm.), his weight, 142 pounds (64.4 Kg.). His skin is somewhat pale but shows no exanthema or other abnormality. There is no edema. The lymph nodes are not enlarged. Examination of the central nervous system and of the respiratory, digestive and genito-urinary systems reveal no abnormalities. The spleen and liver are not enlarged.

Cardiovascular System: The apical impulse is widespread, and its maximum is seen and felt in the fifth intercostal space 11 cm. from the midsternal line. It consists of a systolic thrust, followed by a slight second thrust, diastolic in time. A distinct thrill is palpable over the apical region, both systolic and diastolic in time. Two diastolic murmurs are heard. The one, early in diastole, is decrescendo, high pitched, soft and blowing in character. It is audible over the base and along the left sternal border, with the maximum intensity in the region of the third and fourth intercostal spaces, gradually disappearing in the direction of the apex. The other diastolic murmur, long, rumbling and low pitched, is heard only over a small area in the region of the apex and is accentuated when the patient leans toward the left side. These murmurs are considered as being indicative of the presence of aortic regurgitation and mitral stenosis respectively. The pulse rate is regular, with a frequency during rest (standing) of 70 per minute.

there being no pulse deficit. The pulse is collapsing in type and of large amplitude. The arterial walls are not thickened, irregular or tortuous. The blood pressure has varied on different occasions from 150 mm. of mercury systolic and 60 diastolic to 130 systolic and 45 diastolic.

Roentgenologic examinations of the heart were carried out on four occasions. In May 1936 the transverse diameter of the heart was 14.9 cm. and of the chest 30 cm., the ratio thus being normal. In December 1937 a careful radiologic examination carried out by Dr. Maurice Weinbren again revealed no enlargement of the cardiac silhouette in relation to the outline of the chest. There was no characteristic deformity of any portion of the heart, especially no left ventricular hypertrophy and no enlargement of the left auricle. With a barium sulfate swallow there was a rather marked aortic impression on the esophagus, but there was no increase of the pulmonary artery and the left auricular impression. There was no marked prominence in the region of the conus pulmonalis and also no definite prominence of the left auricle in the oblique view. The aortic arch was high and showed extremely marked pulsation. The lungs were of normal transradiancy, and no adventitious shadows could be seen.

ELECTROCARDIOGRAPHIC STUDIES

Electrocardiograms were obtained under different conditions. On one occasion immediately after a run of 20 miles serial electrocardiograms were taken at five minute intervals over a period of one and one half hours. The methods used for the analysis of the tracings were similar to those elaborated on in a previous paper.¹

Special consideration was given to time intervals and voltage changes which occurred in the various components, to the duration of the cardiac cycle, to the length of ventricular contraction and ventricular diastole, as well as to the sino-auricular-ventricular conduction time. The contour of the serial voltage changes in the various leads was studied and the observations were interpreted in the light of the recent studies published by Schlomka and his collaborators.² In this way it was found that the electrocardiographic reactions were such that it could be concluded that the myocardium and conducting mechanism were of a high standard of efficiency.

Vasomotor Collapse.—On three occasions one of us (E. J.) has had the opportunity of observing in our patient typical attacks of vasomotor collapse. On the first occasion the subject was running in a cross country race when, approximately a quarter of a mile before the finish, he appeared to be unable to maintain his balance and reeled from one side of the road to the other as if intoxicated. Within 220 yards of the finish he collapsed and fell to the ground, where he lay dazed and pale. After a few seconds he rose and, staggering toward the tape, completed the race, when he again collapsed. On this occasion he was deeply unconscious for one minute, dazed and incoordinate for a further fifteen minutes and remained weak and listless for the rest of the day. It is of interest that three days prior to the race he had had an attack of malaria with chills and fever.

Similar attacks occurred on two other occasions. One of these took place one afternoon while training before he had started running. Subsequent to this collapse he rested for a few minutes, after which he ran a distance of 4 miles. The style and speed of this performance, however, were noted to have been comparatively poor, although the patient himself was not aware of this fact.

COMMENT

The significance of this case lies in the relation it bears to the current views on the subject of the alleged dangers of exercise, and especially of what is termed "overexertion," to persons suffering from valvular dis-

ease of the heart. It is generally considered by medical men that patients with valvular disease of the heart should avoid exercise entailing undue exertion, such as competitive games, athletics, gymnastics and heavy manual labor, and that they should limit their activities to the milder forms of exertion, such as walking, golf and perhaps tennis. In fact, it is generally assumed that there exists a clear distinction between the effects on patients with valvular heart disease of light and of severe physical activities respectively. Moreover, in most instances the medical practitioner believes that such patients would actually be incapable of carrying out strenuous physical performances.

Although these views are applied chiefly when one is dealing with patients who are found to have diastolic murmurs, one encounters instances frequently in which physical activities are severely curtailed on medical advice because of the presence of uncomplicated systolic murmurs. With regard to the latter group of cases, such an attitude appears to be entirely unjustifiable in view of ample clinical evidence proving the benign nature of such murmurs, which in most instances do not even indicate organic valvular heart disease.³ One of us⁴ has described the case of the woman Olympic champion of the half mile race in 1928 who had previously been warned not to participate in athletic events because of the presence of an uncomplicated systolic murmur. Her disregard of this advice did not harm her in any way.

We have reason to believe that an attitude similar to that now held concerning uncomplicated systolic murmurs may also be tenable with regard to uncomplicated valvular disease of the heart presenting murmurs diastolic in time when these are due to aortic regurgitation and mitral stenosis or to aortic regurgitation alone, of rheumatic origin.

AORTIC REGURGITATION

There are several instances on record of persons with aortic regurgitation who showed noteworthy physical performances. One of us (E. J., 1936) presented the report of a man with aortic regurgitation of syphilitic origin who was able to carry out most strenuous industrial work, while the other (Suzman) has recently observed a man aged 34 years with aortic regurgitation of rheumatic origin who excels in long distance swimming. Parrisius⁵ reported on a German ski champion presenting the signs of aortic regurgitation. Robinson⁶ quotes Rudolph's report of a soldier aged 25 who, in spite of aortic incompetence as well as of "other valvular defects," was not only able to stand the stress of active service at the front for several years but actually out-rivalled his fellows as an athlete. Cotton's⁷ studies of soldiers indicate that aortic regurgitation is compatible with health, and he states that "disease of the aortic valve in itself gives rise to no symptoms." Robinson relates that he had an opportunity of seeing almost daily a colleague who had pronounced signs of aortic incompetence following rheumatic infection at the age of 5. Although he led an unusually active life and

3. Mackenzie, James: *Diseases of the Heart*, ed. 4, London, Oxford University Press, 1918. Lewis, Thomas: *The Soldier's Heart and the Effort Syndrome*, London, His Majesty's Stationery Office, 1918. Jokl and Parade.⁴

4. Jokl, Ernst, and Parade, G. W.: Zur Frage der Beurteilung von Herzfällen in der sportärztlichen Praxis, *Med. Klin.* 20: 1070 (Aug. 4) 1933.

5. Parrisius, W.: Ski Races, *München. med. Wchnchr.* 71:1661 (Nov. 14) 1924.

6. Robinson, G. C.: *Nelson Loose-Leaf Living Medicine*, New York, Thomas Nelson & Sons.

7. Cotton, T. F.: Mitral Stenosis in Soldiers, *Brit. M. J.* 2:840 (Dec. 27) 1919; Observations on Aortic Disease in Soldiers, *Lancet* 2: 470 (Sept. 13) 1919.

1. Suzman, M. M., and Jokl, Ernst: An Analysis of a Series of Electrocardiograms Taken After Prolonged Intense Muscular Activity, *South African J. M. Sc.* 1: 206 (June) 1936.

2. Schlomka, G., and Reindell, H.: Das Belastungs-Elektrokardiogramm: II, *Arbeitsphysiol.* S: 172, 1934. Schlomka, G.: Das Belastungs-Elektrokardiogramm: III, *ibid.* S: 705, 1935. Schlomka, G., and Lammer, C.: Das Belastungs-Elektrokardiogramm: IV, *ibid.* S: 742, 1935.

engaged at one time in college sports, he had no symptoms. Finally, at the age of 32 he died of *Streptococcus viridans* infection. At autopsy the cusps of the aortic valve were extensively retracted and thickened and the left ventricle was hypertrophied but not greatly dilated.

Parade⁸ described three cases of aortic regurgitation: A man aged 20, although being aware that "there was something wrong with his heart," had never complained and had been a keen football player, cyclist, ski runner and paddler. Another patient of Parade's, aged 24, with aortic regurgitation who had rheumatic arthritis a few years previously, was a keen sportsman and successful in athletic competitions. The third patient was an athlete aged 20 with aortic regurgitation. This man, whose condition is stated to have been of a congenital nature, had during his school days freely participated in sports and exercises. Later he became a keen ski runner and participated in rowing regattas and in tennis tournaments.

Dietlen⁹ appears to be well acquainted with the fact that aortic regurgitation by no means makes outstanding physical performances impossible but considers it necessary to emphasize that great care must be exercised by persons in whom the condition has recently originated and that every person with aortic regurgitation must be kept under constant medical observation.

According to Warfield,¹⁰ during the examination of some 40,000 young recruits at a camp in 1918 there were a number of youths with aortic insufficiency who were athletes, some record holders, who were quite unaware that they had any heart lesions. While he holds that men with such heart lesions should not enter competitive sports, his observations indicate the extent to which the compensated heart, though mechanically embarrassed, is able to perform. Warfield concludes that the child with a heart lesion should not necessarily be made into a "softie," although he makes one exception in that he urges such an individual not to attempt to swim beyond his depth and not to participate in swimming races or to play water polo.

Matthes¹¹ described the case of a soldier who was actively engaged in military service for a period of twenty years following the occurrence of aortic regurgitation, an aftermath of scarlet fever.

In an attempt to give a pathophysiologic explanation of the fact that patients with aortic regurgitation often show a high degree of physical efficiency, Schneyer¹² made systematic investigations of the effects on rabbits of experimentally produced valvular defects. He observed that, while after mitral regurgitation, tricuspidal regurgitation, aortic stenosis and pulmonary stenosis the "medium blood pressure" returns to the preexperimental level, aortic regurgitation on the other hand leads to a considerable permanent drop of "medium blood pressure." The extent of the valvular destruction has no influence on this reaction. Systolic pressure in cases of aortic regurgitation was found to be mostly above the pretraumatic level. (Although Schneyer does not clearly define his term "medium blood pressure," we assume that he refers to a level

closely related to the diastolic pressure.) Fall of blood pressure leads to a lessening of the tone of the pressoreceptive nerves. Thus the precapillary bed constricts and prevents a further fall in blood pressure. Actually Schneyer has shown that the drop of blood pressure which immediately follows experimental production of aortic regurgitation in rabbits is doubled if the compensatory interference of the carotid sinuses is prevented by surgical denervation of these structures. Schneyer emphasizes that aortic regurgitation is the only valvular lesion in which nervous control from the carotid sinuses counteracts and compensates the hydrostatic effects.

MITRAL DISEASE

Jokl and Parade⁴ investigated the case of a cycling champion whose racing performances rapidly declined following an attack of rheumatic fever which resulted in stenosis of the mitral valve. It was pathetic to see how the patient tried in vain to overcome the handicap of his disease and how his courageous efforts to regain his former athletic prowess actually resulted in an acute severe breakdown during the race.

Among Dennig and Prodger's¹³ experimental subjects were two who suffered from mitral stenosis and regurgitation of rheumatic origin. No signs of decompensation were present. They stress that while healthy subjects show a parallel rise of circulatory minute volume and oxygen consumption, the two patients were unable to increase their minute volume in accordance with their oxygen demands. Their peripheral utilization of oxygen during exercise was considerably greater than that of the healthy subjects. It is of interest that, in spite of these unfavorable results, one of the patients was able to carry out strenuous work in a quarry, that he played football and that during his stay at the clinic the investigators were able to study his reactions to a long distance race. Prodger and Korth¹⁴ mention a patient with mitral stenosis and insufficiency who was compelled to discontinue exercise because hemoptysis developed. Using Knipping's apparatus, Marzahn¹⁵ examined a patient with mitral stenosis and regurgitation whose pulse rate rose to 222 a minute during exercise of medium intensity. His circulatory minute volume was low (6 liters) and his maximal oxygen intake was limited (1,200 cc.). A normal person whose circulatory reactions were studied as control showed during a performance test of considerably greater intensity a maximal pulse rate of only 150 a minute and an oxygen intake of 2,800 cc. a minute. Herxheimer¹⁶ writes that mitral stenosis always leads to an impairment of physical efficiency even if the deterioration of blood circulation is preceded by a short period of comparatively high working capacity of the heart. Edens¹⁷ draws attention to the fact that a hypertrophied and dilated right heart is sometimes responsible for a satisfactory functional capacity of the blood circulation during rest but that the emptying of blood depots during physical exertion often leads to a breakdown of the working ability of the left ventricle, the result being pulmonary edema. He illustrates his statement with a history concerning a young woman with mitral stenosis in whom pulmonary edema developed after a physical

8. Parade, G. W.: *Herzkrankungen und Sport*, Med. Welt 10: 1101 (Aug. 1) 1936.

9. Dietlen, Hans: *Herzgrösse; Herzmessmethoden, Anpassung, Hypertrophie, Dilatation, Tonus des Herzens*, in *Handbuch der normalen und pathol. Physiologie*, Berlin, 1926.

10. Warfield, L. M.: *The Heart and Athletics: Modern Concepts of Cardiovascular Disease*, monthly publication of the Am. Heart Assoc., vol. III, May 1934, No. 5.

11. Matthes, M.: *Lehrbuch der Differentialdiagnose innerer Krankheiten*, edited by Hans Curschmann, Berlin, Julius Springer, 1934.

12. Schneyer, K.: *Beobachtungen an experimentellen Herzklappenfehlern*, Verhandl. d. deutsch. Gesellsch. f. Kreislaufforsch., pp. 312-316, 1934.

13. Dennig, Helmut, and Prodger, S. H.: *Herzkrankheiten bei Arbeit*, Deutsches Arch. f. klin. Med. 175: 170, 1933.

14. Prodger, S. H., and Korth, C.: *Effect of Light Muscular Training on Patients with Heart Disease*, Arch. Int. Med. 55: 204 (Feb.) 1935.

15. Marzahn, H.: *Elektrokardiographische Untersuchungen bei Arbeit*, Ztschr. f. klin. Med. 130: 135, 1936.

16. Herxheimer, H.: *Grundriss der Sportmedizin*, Leipzig, Georg Thieme, 1932.

17. Edens, E.: *Ueber die Störungen des Kreislaufs bei Mitralfehlern*, Klin. Wchnschr. 18: 405 (March 25) 1939.

performance of some magnitude. Edens concludes by saying that the heart is practically unable to compensate for stenosis of the mitral valve by myocardial adjustment such as occurs with other valvular defects. He therefore recommends the utmost care in the treatment of the condition and avoidance of strain of any description. The investigations made by Stewart and his collaborators¹⁸ show clearly that the functional capacity of the heart is always markedly impaired if stenosis of the mitral valve is present, while insufficiency of the aortic valve either as an isolated defect or as a superimposed defect on mitral stenosis is compatible with little or even practically no functional impairment.

Since stenosis of the mitral valve invariably causes a distinct impairment of physical capability, we believe that it is the hemodynamic disturbance peculiar to this valvular lesion, namely the defective filling of the left ventricle and the consequent venous congestion, which is the primary responsible factor, although it is understood that a poor myocardium must enhance the disability still further.

AORTIC REGURGITATION AND MITRAL STENOSIS

When mitral stenosis is accompanied by aortic regurgitation, the effects on physical efficiency appear to be entirely different from those which are observed with mitral stenosis alone.

Prodger and Korth¹⁴ carried out a study of the effects of light muscular training on six patients with valvular heart disease, three of whom had mitral stenosis and regurgitation with aortic insufficiency, while the other three had only mitral stenosis and insufficiency. The most striking improvement of physical efficiency during training was observed in the patients with the double valvular lesion, whereas the patients who failed to show favorable effects of training had disease of the mitral valve alone. "It might be thought," Prodger and Korth conclude, "that the changes which occur during training, whatever they are, are dependent on an adjustment between the greater and lesser circulations which can take place in the patient with a balanced disturbance, as it were, in both valves, whereas it cannot take place in a patient with the imbalance resulting from disease only of the mitral valve."

Nielsen¹⁹ states that aortic regurgitation and mitral stenosis together have a better prognosis than either alone. He adds that, of the two, aortic regurgitation is the more serious condition as far as life is concerned, while as far as work is concerned mitral stenosis is the more serious.

Stewart and his collaborators¹⁸ studied the effects of valvular heart disease on the dynamics of the circulation by observing the arteriovenous oxygen difference, cardiac index, cardiac output per beat, stroke volume per kilogram and left ventricular work per beat kilogram. As previously mentioned, they found that impairment of the functional capacity of the heart was less in those patients who suffered from a combination of mitral stenosis and aortic insufficiency, as compared with those who suffered from only mitral disease, and inferred therefore that aortic regurgitation is of functional benefit when superimposed on the mitral lesion. Aortic stenosis either alone or superimposed on the aforementioned valvular defects had an unfavorable effect.

It thus appears that the observations of other writers bear out the observations made on our patient, who in spite of the existing mitral stenosis, with its recognized unfavorable influence on working capacity, has been capable of extraordinary physical performances. It is reasonable to believe that, had the patient not had aortic regurgitation in addition, he almost certainly would have been unable to carry out the performances reported.

It is beyond doubt that his heart muscle is of the highest functional capacity. This is confirmed not only by the fact that the heart shadow is of normal size but also by the results of the electrocardiographic studies under conditions of severe muscular exertion. In view of our patient's high physical efficiency, this is what one would expect.

In view of the known benign effects of uncomplicated aortic regurgitation on physical performances, it is considered that the latter lesion (aortic regurgitation) has compensated for the disability expected from the coexisting mitral stenosis. In fact, we consider that overcompensation in this direction may have taken place, for, like Stewart and his collaborators, we have reason to believe that the presence of aortic regurgitation aids circulatory efficiency.

High pulse pressure, always regarded as a characteristic clinical sign of aortic regurgitation, has also been found in first class athletes²⁰ as well as in subjects with good resistance power against hot environment (Jokl and Weiner²¹), while an increase of pulse pressure has been observed during a period of systematic physical training in young recruits simultaneously with an improvement of endurance power.²² In other words, there is at least one hemodynamic factor which is common to subjects with a high standard of physical efficiency as well as to persons with aortic regurgitation. It must however be pointed out that high pulse pressure cannot be the only factor responsible for the high standard of physical efficiency, as it is well known that high pulse pressure is found in cases of hyperthyroidism and of beriberi, in which conditions physical efficiency is greatly impaired.

In addition to the case dealt with in this paper, we have recently studied two other athletes with mitral stenosis and aortic regurgitation, so that the fact seems to be established that the combined valvular lesion of mitral stenosis and aortic regurgitation and a high standard of physical efficiency are by no means irreconcilable.

SUMMARY

1. A marathon runner was observed to have mitral stenosis and aortic regurgitation.

2. The significance of this case is worthy of note in view of current opinions on the subject of the alleged dangers of exercise to persons suffering from valvular disease of the heart.

3. The recently adopted more liberal prognostic interpretation of systolic murmurs may also be tenable with regard to uncomplicated valvular heart disease presenting diastolic murmurs when these are due to combined aortic regurgitation and mitral stenosis or to aortic regurgitation alone, of rheumatic origin.

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18. Stewart, H. J.; Deitrick, J. E.; Watson, R. F.; Wheeler, C. H., and Crane, N. F.: The Effect of Valvular Heart Disease on the Dynamics of the Circulation, *Am. Heart J.* 10: 477 (Oct.) 1938.

19. Nielsen, H. E.: Clinical Investigations into the Cardiac Output of Patients with Compensated Heart Disease During Rest and During Muscular Work, *Acta. med. Scandinav.* 91: 223, 1937.

20. Bramwell, Crichton, and Ellis, R.: Clinical Observations on Olympic Athletes: Results of Medical Observations During Eleventh Olympic Games, 1928 (Amsterdam), Berlin, 1929.

21. Weiner, J. S.: An Experimental Study of Heart Collapse, *J. Indust. Hyg. & Toxicol.* 20: 389 (June) 1938.

22. Jokl, Ernst, and Goedvolk, C.: A Study of the Effects of Military Training upon Physical Efficiency of Young Recruits, to be published.

A STUDY OF "FALSE" FRIEDMAN
TESTS FOR PREGNANCY

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In 1927 Aschheim and Zondek¹ reported that the urine of pregnant women contained large amounts of a substance capable of stimulating the ovaries in a manner similar to the action of the gonadotropic principle of the anterior lobe of the pituitary gland. This substance is now known as the anterior pituitary-like hormone. In 1928 these investigators² published the results of experiments in which they injected into mice the urine of pregnant women. Friedman³ in the following year noted that the ovary of the rabbit likewise responded to injections of urine obtained from pregnant women. In 1931 Friedman and Lapham⁴ published their application of this fact as a method of diagnosis for pregnancy. A survey of the reports published subsequently emphasizes the high degree of accuracy of the results obtained with the hormonal tests for pregnancy. However, these tests in common with other biologic tests are subject to errors, some of which may be due to faulty technic or may be inherent in the limitations of the test.

This report is based on 645 Friedman tests performed at the Mayo Clinic. Subsequent histories and observations established the presence or absence of pregnancy at the time the test was performed. Three hundred and two tests gave positive results and 343 gave negative results. Ten positive reactions occurred in the absence of pregnancy, and seven negative reactions were obtained when pregnancy was present. Thus, in 2.63 per cent of the tests the result was at variance with the ultimate diagnosis. The great majority of patients tested were those concerning whom the diagnosis of the presence or absence of pregnancy could not be determined definitely by history and physical examination at the time the Friedman test was performed.

The technic of the test is as follows: From 8 to 15 cc. of urine is injected slowly into the marginal ear vein of the rabbit. After forty-eight hours the animal is examined. Positive results of the test are indicated, on gross examination, by the presence of corpora hemorrhagica or corpora lutea or both. If these conditions are not clearly evident, the test is considered as giving negative results. Marked congestion of the uterus and oviducts is often strikingly present when the test gives positive results.

Certain precautions are observed in the performance of the test. The first urine passed in the morning is used and is injected within an hour or is kept on ice

until it is used. If the urine is cloudy it is filtered. Rabbits younger than 2½ months are not used, but no objection has been found to the use of older rabbits if they have not recently copulated. To preclude copulation and pregnancy, the test animals are isolated in single cages for three weeks before they are used.

Since Friedman described the test there has been a tendency to modify it and still refer to it as the Friedman test. Thus, certain authors have concentrated the urine, others have injected urine into the rabbits several times over a period of several days, and others have used very large quantities of urine. Since the test is based not only on the fact that the rabbit does not spontaneously ovulate but also that the ovary of the rabbit is relatively insusceptible to the anterior pituitary-like hormone and that there are large quantities of such hormones in the urine of pregnant women, it is necessary that the dose of urine be restricted to amounts not greater than advocated by Friedman. If rabbits are injected with 8 to 15 cc. of the first urine passed in the morning and a positive result is obtained, the deduction that the patient is pregnant is justified. The total error in such deductions will not be more than 3 per cent, which, when compared with other biologic tests, is almost unbelievably accurate. Many more positive results will be obtained if larger quantities of urine are injected, but under these conditions one is not justified in deducing that the patient is pregnant, although this will be true in a large percentage of cases. In like manner, if positive results are obtained when small amounts of urine are injected, one may conclude that there is more hormone similar to that secreted from the anterior lobe of the pituitary gland than is present in normal pregnancy. One can eliminate so-called false positives due to such conditions as hydatidiform mole and chorio-epithelioma by injecting small amounts of urine into rabbits when these conditions are suspected.

It is our purpose in this paper to consider the relatively small group of reactions (seventeen of 645) that did not coincide with the diagnosis of the presence or absence of pregnancy. The Aschheim-Zondek and Friedman reactions are often considered as tests for pregnancy per se. However, it must be remembered that these are tests for the detection of the presence in the urine of a substance (like that secreted by the pituitary gland) capable of stimulating the ovaries of the test animal. This substance (or these substances) may be found in the presence of several physiologic and pathologic states other than pregnancy. Therefore it is natural to expect that such a fact would affect the accuracy of the test for pregnancy. Thus the terms "false positive test" and "false negative test" have been avoided in this paper because, in spite of the fact that they may be false with regard to the presence or absence of pregnancy, they may be true with regard to the presence or absence of demonstrable quantities of the principle or principles in the urine. In other words, the so-called error is not usually due to a failure in the test itself but is due to an associated physiologic or pathologic condition.

In evaluating the reliability of the Friedman test it is important to know some of the conditions which may give positive reactions in the absence of pregnancy. A review of the literature discloses the following conditions as being associated with positive reactions given by nonpregnant women: spontaneous or artificial menopause, menstrual disorders, ovarian cysts, carcinoma,

From the Section on Obstetrics and Gynecology (Dr. Randall) and the Division of Clinical Pathology, Section on Parasitology, the Mayo Clinic (Dr. Magath).

1. Aschheim, Selmar, and Zondek, Bernhard: *Ei und Hormon*, Klin. Wehnschr. 6: 1321 (July 9) 1927.

2. Aschheim, Selmar, and Zondek, Bernhard: *Die Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenvorderlappenhormons*, Klin. Wehnschr. 7: 1453-1457 (July 29) 1928.

3. Friedman, M. H.: *Effect of Injections of Urine from Pregnant Women on Ovary of the Rabbit*, Proc. Soc. Exper. Biol. & Med. 26: 720-721 (May) 1929; *Mechanism of Ovulation in the Rabbit: II. Ovulation Produced by the Injection of Urine from Pregnant Women*, Am. J. Physiol. 90: 617-622 (Nov.) 1929.

4. Friedman, M. H., and Lapham, M. E.: *Simple, Rapid Procedure for Laboratory Diagnosis of Early Pregnancies*, Am. J. Obst. & Gynec. 21: 405-410 (March) 1931.

treatment with anterior pituitary preparations, pelvic inflammatory disease, myxedema, gallbladder disease, genital tuberculosis and errors in technic.

MENOPAUSE

The menopause is one of the conditions which may give rise to a positive reaction from the urine of non-pregnant women. The decrease in ovarian activity associated with the climacteric is usually accompanied by an increased activity of the anterior lobe of the pituitary gland with a resultant increase in secretion of gonadotropic principle in an attempt to stimulate the failing ovary. Drips and others⁵ found gonadotropic principle present in the urine in excessive amounts in 57 per cent of a series of women during the menopause. The severity of the hot flushes experienced by these women varied directly with the degree of excess gonadotropic principle found in their urine. Mazer⁶ investigated the hormone content of the blood of women during the menopause. He found an excess amount of pituitary principle in about 60 per cent. The excretion of this principle in the urine may well account for the positive Friedman tests occasionally reported during the climacteric. Feresten,⁷ Hannan,⁸ Heiberg,⁹ Mills,¹⁰ Mull and Underwood,¹¹ and Ziserman¹² have reported positive pregnancy hormone tests given by menopausal women who were not pregnant. The group of patients studied by us included two cases in which positive Friedman reactions were given by nonpregnant women at the menopause.

Illustrative Case.—A woman aged 48 had been having irregular menses and hot flushes for eight years prior to coming to the clinic. In the past year she had had two periods of menstrual flow, the last of which had occurred three months prior to the performance of the Friedman test, which was reported as giving positive results. The hot flushes had been of increased severity during the past year. Her reply to our questionnaire revealed that she had not been pregnant.

MENSTRUAL DISORDERS

The same state of compensatory increased excretion of gonadotropic principle in the urine may occur in cases of pituitary-ovarian imbalance among younger women. In addition to irregular and abnormal menses, the patients may give complaints such as soreness of the breasts, increased nervousness prior to the menses, dysmenorrhea, menstrual migraine and occasionally menstrual edema or acne. It is reasonable to assume that the degree of severity of these subjective symptoms is usually proportional to the degree of disturbance of the normal relationship between the amounts of estrogenic hormone and gonadotropic principle. The amenorrhea that sometimes occurs in this type of case may be interpreted as a symptom of pregnancy, and further confusion may occur if a positive Friedman reaction is obtained. Studies of the blood or urine for estrogen

are important to establish a definite diagnosis. The concentration of estrogen is usually low or zero in the urine of patients with primary ovarian failure but is high in pregnancy.¹³ Estimations of pregnandiol are of value in the differential diagnosis in such cases. Wilson and one of us¹⁴ found higher values for this excretion product of progesterone in the urine in early pregnancy than in urine of women with normal or abnormal menstrual function.

Mull and Underwood,¹¹ Reinhart¹⁵ and Ziserman¹² have reported positive pregnancy reactions associated with menstrual disorders of nonpregnant women; the exact nature of the disorder, however, was not definitely stated.

Illustrative Case.—A woman aged 24 gave a history of irregular menses with a profuse flow of eight to ten days' duration and a period of amenorrhea for six months on one occasion in the absence of pregnancy. She had been amenorrheic for thirteen weeks when seen by us, and although physical examination revealed a questionably enlarged uterus its size did not correspond with that of a uterus after thirteen weeks of gestation. The Friedman reaction was positive. Another test, four weeks later, likewise gave a positive result. At the time of the latter Friedman test menstrual spotting had occurred for four days, without any particular discomfort, and continued for six days thereafter. Physical examination seven weeks later, with no menses in the interim, revealed no signs of pregnancy.

LOW BASAL METABOLIC RATE WITHOUT MYXEDEMA

The condition of nonpregnant patients who have a lowered rate of basal metabolism without myxedema, associated with amenorrhea and a positive Friedman reaction, might be considered to be ovarian failure secondary to deficiency of function of the thyroid gland. Bamforth¹⁶ reported one case of amenorrhea in which the basal metabolic rate was —37 per cent and the reaction to the Friedman test was positive although the patient was not pregnant.

Illustrative Case.—A woman aged 30 had had a sudden severe attack of gallbladder colic and cholecystectomy was advised. She gave a history of irregular menses; she had had periods of amenorrhea of from three to five months' duration. On one occasion she had menstruated for seven weeks. Her last menstrual period had occurred seven weeks before the physical examination, which revealed a slightly enlarged uterus and a slightly softened cervix. The Friedman test gave a positive result. At the time of cholecystectomy no evidence of pregnancy was found. Later the basal metabolic rate was found to be —19 per cent. Following treatment with desiccated thyroid the basal metabolic rate was raised to —5 per cent. Following this the menses appeared every six to eight weeks and the patient was subjectively better.

OVARIAN CYSTS

Ovarian cysts have on occasions been associated with positive reactions in the absence of pregnancy.¹⁷ Woodhouse¹⁸ reported two cases in which positive reactions were associated with tuberculous conditions involving the ovary. The explanation of the reaction is hypothetical but it is likely to be due to an endocrine imbalance.

5. Drips, Della G.; Osterberg, A. E.; Fisher, Gertrude, and Lewis, Kathleen: An Evaluation of the Frank Method for the Determination of Prolan (Gonadotropic Principle) in the Urine of Nonpregnant Women, *Endocrinology* 22: 703-710 (Dec.) 1938.

6. Mazer, Charles, and Hoffman, Jacob: Three Hormone Tests for Early Pregnancy: Their Clinical Evaluation: A Comparative Study, *J. A. M. A.* 96: 19-23 (Jan. 3) 1931.

7. Feresten, Morris: Report of 1,600 Aschheim-Zondek Tests (Friedman Modification), *Endocrinology* 21: 116-118 (Jan.) 1937.

8. Hannan, J. H.: The Zondek-Aschheim Test for Pregnancy, *Brit. M. J.* 1: 150-151 (Jan. 25) 1930.

9. Heiberg, Borge: Reliability of Friedman Test as Pregnancy Reaction, *Ugesk. f. Leger.* 99: 387-395 (April 8) 1937.

10. Mills, H. R.: Friedman Test for Pregnancy: Report of 213 Cases, *J. Florida M. A.* 22: 11-22 (July) 1935.

11. Mull, J. W., and Underwood, H. D.: Evaluation of Practical Use of Aschheim-Zondek Pregnancy Test, *Am. J. Obst. & Gynec.* 33: 830-833 (May) 1937.

12. Ziserman, A. J.: Incidence and Significance of False Positive Pregnancy Reactions, *Am. J. Obst. & Gynec.* 26: 204-212 (Aug.) 1933.

13. Smith, G. V., and Smith, O. W.: Further Quantitative Determinations of Prolan and Estrin in Pregnancy, with Especial Reference to Late Toxemia and Eclampsia, *Surg., Gynec. & Obst.* 61: 27-35 (July) 1935.

14. Wilson, R. B., and Randall, L. M.: Studies on Pregnandiol: III. Excretion of Pregnandiol in the Diagnosis of Early Pregnancy, *Proc. Staff Meet., Mayo Clin.* 14: 8-10 (Jan. 4) 1939.

15. Reinhart, H. L.: The Results of Two Years' Experience with the Friedman Test, *Am. J. Clin. Path.* 3: 9-15 (Jan.) 1933.

16. Bamforth, Joseph: Experiences for the Friedman Test for Pregnancy, *St. Thomas's Hosp. Rep.* 1: 132-139, 1936.

17. Mull and Underwood,¹¹ Ziserman.¹²

18. Woodhouse, D. L.: Zondek-Aschheim Reaction: Experience and Results in 500 Examinations, *Birmingham M. Rev.* 11: 69-94 (June) 1936.

ance in which again an attempt is being made to stimulate a functionally failing ovary by an excess of anterior pituitary principle.

Illustrative Case.—A woman aged 27 complained of a marked lower abdominal cramping pain which had appeared at the time of an expected menstrual period. However, there had been no flow until seven days later, at which time she had awakened from sleep with vaginal bleeding sufficient in amount to saturate three pads, followed by a decrease in flow such that there had been a mere spotting of blood. Simultaneous with the hemorrhage there had appeared a sharp pain in the right lower quadrant of the abdomen which had confined her to bed. Physical examination revealed a soft, tender mass in the right side of the pelvis. On the third day after the onset of bleeding, microscopic examination of tissue obtained by dilation and curettage disclosed no placental or decidual material. Fifteen days later a Friedman test gave positive results. An exploratory laparotomy revealed a corpus luteum cyst of the right ovary but no evidence of pregnancy. No subsequent evidence of intra-uterine or extra-uterine pregnancy was observed.

MALIGNANCY

Malignant tumors have been mentioned by some authors as a cause of positive pregnancy hormone reactions. Grant and his associates,¹⁹ Büttner²⁰ and King²¹ reported cases of carcinoma associated with positive reactions of women who were not pregnant. Zondek²² first claimed that 15 per cent of a series of patients suffering from malignant diseases gave the characteristic pregnancy response. Later, however, he²³ reported that the urine of women suffering from carcinoma usually produced only maturation of the follicles and rarely produced corpora lutea or follicles that were hemorrhagic. Our series of cases includes one in which a positive reaction was found in association with a squamous cell carcinoma of the cervix and probably with an ovarian cyst in addition.

Illustrative Case.—A woman aged 34 came to the clinic complaining of metrorrhagia and a clear, watery, occasionally bloody, vaginal discharge that had been present for two months. Examination revealed a squamous cell carcinoma of the cervix, stage 4. There was a large, soft anterior mass which appeared to be uterus. The patient's last period of menstrual flow had occurred four weeks before the specimen of urine was collected for the Friedman test. The test gave a positive response.

Radium therapy was instituted but was discontinued after one month owing to the presence of increasing discomfort from the large pelvic abdominal mass. This was incised and drained through a small abdominal incision; 2,000 cc. of an odorless, straw-colored fluid escaped. Later it was thought that the large soft mass, which seemed to be uterus, might well have been an ovarian cyst.

TUBAL PREGNANCY—THREATENED ABORTION

Since the anterior pituitary-like hormone found in the urine of pregnant women is generally conceded to be the product of chorionic villi, the hormone reaction in cases of tubal pregnancy and threatened abortion depends on the presence or absence of viable chorionic tissue. From positive reactions one may conclude that either an intact or growing placenta exists or that the

fetus has recently died. An absolutely negative reaction justifies the contention that the fetus no longer lives. Kurzrok²⁴ reported that he had not seen a hemorrhage from a ruptured tube in the presence of a persistently negative test.

HYDATIDIFORM MOLE—CHORIONIC EPITHELIOMA

The hormone titer may be extremely high in the urine of women who have a hydatidiform mole. The amount of hormone depends somewhat on the size of the mole, the contact with the maternal circulation and the amount of degeneration present in the mole. A positive reaction may exist as long as six weeks following expulsion of the mole. An extremely high concentration of the hormone should arouse a suspicion of chorio-epithelioma, and a persistently positive test for more than six weeks following expulsion of a mole definitely favors the diagnosis of chorio-epithelioma. Our experience with these two conditions is consistent with the positive tests reported by others.

MISCELLANEOUS

The experiences of others in various conditions are pertinent to a study of the causes of unaccountable positive reactions. Bamforth¹⁶ and Mull and Underwood¹¹ reported positive reactions given by women receiving anterior pituitary or anterior pituitary-like preparations. It should be remembered that specimens of urine of women receiving treatment for sterility or menstrual disorders, especially when receiving such preparations, or roentgenologic stimulation to the pituitary, may exhibit a positive Friedman reaction in the absence of pregnancy. Various authors have reported pelvic inflammatory disease, tubo-ovarian abscess, menorrhagia of puberty, hypertensive cardiac disease and cholecystitis as being associated with positive pregnancy reactions. Kraus²⁵ reported that increased intracranial pressure, such as that caused by tumors of the pituitary gland and compensatory hypertrophy of the pituitary gland must be considered as causes of increased excretion of gonadotropic principle in the urine. Never to be forgotten are the errors in technic which may appear in any type of biologic test.

NEGATIVE FRIEDMAN REACTIONS GIVEN BY PREGNANT WOMEN

A review of the literature discloses the following circumstances that may be associated with a negative reaction in the ovaries of the rabbit in the presence of pregnancy: performance of the test too early in the pregnancy, performance of the test prior to a miscarriage of nonviable chorionic tissue, a diluted specimen of urine, insensitivity of rabbit's ovary, hormone secretion in amounts insufficient to cause stimulation of the ovaries, and delayed injection of the urine with consequent deterioration of the anterior pituitary-like principle. Ovarian cysts have been found in examination of patients whose urine gave a negative result to the Friedman test.

In three of our cases of pregnancy that gave a negative reaction, the Friedman test was repeated at a later date and in each instance the second test gave a positive response. This serves to emphasize the importance of a second test when negative results to the test are obtained in the face of other evidence suggestive of

19. Grant, W. H.; Zibel, Nathan, and MacMahon, H. E.: Use of the Rabbit in the Aschheim-Zondek Test for Pregnancy, *New England J. Med.* **206**: 893-898 (April 28) 1932.

20. Büttner, W.: Ueber die biologische Schwangerschaftsdiagnose am Kaninchen als Testobjekt, *Zentralbl. f. Gynäk.* **56**: 2050-2057 (Aug. 20) 1932.

21. King, A. G.: Friedman Rabbit Ovulation Test in Differential Obstetric Diagnosis, *J. Lab. & Clin. Med.* **19**: 1033-1040 (July) 1934.

22. Zondek, Bernhard: Ueber die Hormone des Hypophysenvorderlappens: III. Follikelreifungshormon (Prolan A) und Tumoren, *Klin. Wchnschr.* **9**: 679-682 (April 12) 1930.

23. Zondek, Bernhard: The Relation of the Anterior Lobe of the Hypophysis to Genital Function, *Am. J. Obst. & Gynec.* **24**: 836-843 (Dec.) 1932.

24. Kurzrok, R.: Relation of Pituitary Gland to Pregnancy and Labor, *A. Research Nerv. & Ment. Dis., Proc.* **17**: 321-339, 1938.

25. Kraus, E. J.: Ueber Degeneration des ischemischen Hirndrucks: zugleich ein Beitrag zur Degeneration der Ovarien, *Klin. Wchnschr.* **11**: 32.

pregnancy. One of the specimens of urine tested was somewhat old, having been submitted several hours after voiding. Another patient submitted the second specimen of urine passed in the morning, which would be expected to be more dilute in hormone concentration than the first specimen.

It is quite generally recognized that a negative Friedman reaction earlier than six weeks after the last period of menstrual flow cannot be relied on, since the concentration of hormone in the urine prior to this time frequently is not sufficient to indicate a positive reaction. In five of our seven cases in which the urine to be tested was obtained between the sixth and seventh week after the last period of menstrual flow the reaction was negative, although the patients were proved subsequently to have been pregnant. From the results in these five cases, it seems likely that at times the hormone concentration may not be great enough to give a positive reaction before the seventh week.

It is interesting to note that two patients had been treated for syphilis and that each had had manifestations in the central nervous system.

Illustrative Case.—A woman aged 35 had her last menstruation forty-nine days before presenting herself for examination. She had experienced some nausea and vomiting for the past two or three weeks. Physical examination revealed a rather soft, slightly enlarged uterus and also a tender cystic mass high in the right pelvis. A Friedman test gave a negative reaction. Ten days later right salpingectomy was done for removal of a hydrosalpinx, and an intra-uterine gestation was then definitely diagnosed. A second Friedman test four weeks thereafter gave a positive response. She was delivered of a full-term baby forty weeks from the time of her last period of menstrual flow.

CONCLUSIONS

1. The Friedman test is based primarily on the fact that if anterior pituitary-like hormones are present in the urine in certain amounts they will be demonstrable by typical reactions in the ovary of the rabbit. While the test is not a test of pregnancy from an academic point of view, to all practical purposes it is so if the correct technic is followed.

2. Therefore the Friedman test is based on quantitative considerations. Excretion of the gonadotropic principle of the anterior lobe of the hypophysis in the urine in excess amounts may be responsible for a positive Friedman reaction in the absence of pregnancy.

3. Among the several physiologic and pathologic states other than normal pregnancy which may give a positive reaction are hydatidiform mole, chorio-epithelioma, the menopause, menstrual disorders such as primary ovarian failure, treatment with preparations of the anterior lobe of the pituitary gland and errors in technic.

4. A negative reaction to the Friedman test prior to the seventh week after the last menstrual period may not be conclusive, although authentic positive reactions may be obtained much earlier, frequently within four weeks after impregnation. A test that gives negative results before the seventh week should be repeated later.

Air Ambulances.—Airplanes were first used as ambulances rather inadvertently during the World War when pilots or observers flying over the enemy lines were sometimes wounded and yet able to fly back to their own landing fields where medical attention was available. France and England in 1919 were apparently the first countries to assign certain airplanes to the transportation of the sick and wounded.—Armstrong, Harry G.: *Principles and Practice of Aviation Medicine*, Baltimore, Williams & Wilkins Company, 1939.

VISUALIZATION OF THE CHAMBERS OF THE HEART

THE PULMONARY CIRCULATION AND THE GREAT BLOOD VESSELS IN MAN: SUMMARY OF METHOD AND RESULTS

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In 1938 we first described our method of visualizing the chambers of the heart, the pulmonary circulation and the great blood vessels and later published a detailed account of the technic and a summary of the results obtained in the first 133 cases.¹ Before that time there had been no practical way of visualizing the interior of the heart and of the intrathoracic blood vessels. Although the roentgen ray had become almost indispensable to the accurate diagnosis of heart and lung diseases, it gave an incomplete picture of the anatomy of the cardiovascular system, because the four separate chambers of the heart and their component parts were represented on roentgenogram and fluoroscopic screen by one shadow, and the intrathoracic blood vessels were seen indistinctly if at all. Roentgenologic diagnosis, therefore, had to rely on such indirect evidences of disease as alteration in the size, shape and pulsation of the cardiac and vascular shadows and the distortion and displacement of the esophagus, the trachea and the bronchi.

In other regions of the body such as the gastrointestinal, the genito-urinary and the tracheobronchial systems, more complete visualization of structure has been obtained by the use of contrast roentgenography; but this principle has heretofore had limited success when applied to the heart and the blood vessels within the thorax. In 1931 Forssmann² tried unsuccessfully to outline the interior of the heart by the injection of iopax into the right atrium through a catheter which he had introduced into a vein in the arm and advanced to the heart. In the same year Egas Moniz, Lopo de Carvalho and Almeida Lima³ succeeded in visualizing the pulmonary arterial tree by cardiac catheterization and the use of a 120 per cent solution of sodium iodide. Several years later Nuvoli⁴ visualized the thoracic aorta of two patients by puncture of the left ventricle and the ascending aorta, respectively, and the injection of sodium iodide. Two years ago Castellanos, Pereiras and Argelio Garcia⁵ described their method of outlining the superior vena cava, the right cardiac chambers and the pulmonary arterial tree in infants and in chil-

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1. Robb, G. P., and Steinberg, Israel: A Practical Method of Visualization of the Chambers of the Heart, the Pulmonary Circulation and the Great Blood Vessels in Man. *J. Clin. Investigation* 17: 507 (July) 1938.

2. Forssmann, W.: Ueber Kontrastdarstellung der Höhlen des lebenden rechten Herzens und der Lungenschlagader. *München. med. Wchnschr.* 78: 489 (March 20) 1931.

3. Egas Moniz, Lopo de Carvalho and Almeida Lima: Angiographie. *Presse méd.* 39: 996 (July 4) 1931.

4. Nuvoli, Innocenzo: Arteriografia dell'aorta toracica mediante punctura dell'aorta ascendente o del ventricolo s., *Policlinico (sez. prat.)* 43: 227 (Feb. 10) 1936.

5. Castellanos, Agustín; Pereiras, Raúl, and Argelio Garcia: Angiocardiography in the Child, VII Cong. Assn. Med. Pan American, Havana, 1938. Castellanos, Agustín; Pereiras, Raúl; Argelio Garcia, and Vázquez Pausa, Angel: On the factors intervening in the obtention of perfect angiocardigrams. *Bol. Soc. cubana de pediat.* 10: 217 (May) 1938.

dren less than 14 years of age by the intravenous injection of diodrast and iopax. These authors, however, could not visualize the right side of the heart and the pulmonary vessels of older persons, nor could they visualize the left chambers and the aorta except fortuitously in a few instances of congenital shunt from the right to the left side of the heart.

METHOD

Technic.—Our method of visualization consists of two fundamental parts: (1) opacification of the chambers of the heart and the blood vessels within the thorax by the intravenous injection of a radiopaque solution (70 per cent diodrast) and (2) roentgenography of these structures at the moment of their opacification.

The procedure is performed in two stages. In the first one the patient is seated with his arm resting on a table, and a specially designed 12 gage Lindemann needle with stopcock attached⁶ is inserted into the principal vein at the elbow. After the position of the needle within the lumen has been verified by the injection of physiologic solution of sodium chloride, the circulation time from the needle to the pulmonary capillaries and to the carotid sinus is determined by modifications of the ether⁷ and the cyanide⁸ method respectively.

In the second stage, the patient is seated before the cassette in the position giving the best view of the structures to be visualized (table 1). A special 50 cc. Luer-Lok syringe having a 12 gage tip⁶ and containing from 30 to 45 cc. of the 70 per cent solution of diodrast⁹ is attached to the needle-stopcock unit and approximately 15 cc. of blood is drawn into the syringe.

All is now ready for visualization. Under the injector's direction the patient exhales forcibly and then, at the command "Breathe in" he inspires deeply and quickly, and the injection is begun. The inspiratory position is held until the diodrast has had time to reach the pulmonary arterial tree and the first exposure has been made. The patient then exhales passively and breathes in again just before the time for opacification of the left side of the heart. The injection of the diodrast should be completed within two seconds. Roentgenograms are made at the predicted time of arrival of the opaque solution in the

TABLE 1.—Optimal Positions During Visualization

Structure to Be Visualized	Positions
Superior vena cava	Frontal and lateral
Cardiac chambers	Left and right anterior oblique
Cardiac walls and ventricular septum	Left oblique
Pulmonary and aortic valves	Right and left oblique
Pulmonary artery	Lateral and frontal
Right pulmonary artery	Right oblique and frontal
Left pulmonary artery	Left oblique
Smaller pulmonary vessels	Frontal
Pulmonary veins	Frontal, right and left oblique
Thoracic aorta and branches	Left and right oblique
Abdominal aorta and branches	Frontal

regions to be visualized, the predictions being based on the ether and the cyanide circulation times. For the normal person the intervals between the injection and the opacification of the various divisions of the cardiovascular system are surprisingly short (table 2). Except for overpenetration, the roentgenographic technic is that ordinarily used for the heart and the lungs.

THE CLINICAL MATERIAL

A total of 486 injections has been made on 233 patients, of whom fifty-seven were normal, seven had mediastinal disease, eighty had heart disease and eighty-nine had lung disease.

6. Made by Becton, Dickinson & Co.
7. Hitzig, W. M.: Measurement of Circulation Time from Antecubital Veins to Pulmonary Capillaries, *Proc. Soc. Exper. Biol. & Med.* 31: 935 (May) 1934.

8. Robb, G. P., and Weiss, Soma: Method for Measurement of Velocity of Pulmonary and Peripheral Venous Blood Flow in Man, *Am. Heart J.* 8: 650 (June) 1933.

9. Diodrast, concentrated solution (70 per cent), manufactured by the Winthrop Chemical Company, Inc.

RESULTS

Our observations regarding the normal cardiovascular system¹⁴ and the changes occurring in mediastinal,¹⁵ cardiac¹⁶ and pulmonary¹⁷ disease will now be presented briefly.

Mediastinal Disease.—The value of visualization in the diagnosis of mediastinal disease has been demonstrated by the results obtained in our series of seven patients. Five patients exhibited collateral circulation from the upper extremities and other signs and symptoms indicative of obstruction of the superior vena cava. Complete occlusion of this vessel, however, was excluded in every case by visualization, but a significant

TABLE 2.—Average Normal Intervals Between Beginning of Injection and Opacification

Structure	Interval in Seconds
Superior vena cava and right atrium.....	1.5
Right ventricle and pulmonary arterial circulation....	2-3
Pulmonary veins and left atrium.....	5-7
Left ventricle.....	7-9
Thoracic aorta.....	8-10
Abdominal aorta.....	10-12

degree of stenosis was found in three instances. In the first of these the constriction was caused by metastases to the mediastinum from a primary carcinoma of the right upper bronchus. The second patient (figs. 1 and 2) showed conspicuous narrowing of the right innominate vein and the superior vena cava caused by a mediastinal tumor, which on necropsy proved to be a fibrosarcoma. There was extensive collateral circulation through the usual pathways of the thorax and shoulder girdle and, of greater interest, by way of the internal mammary and the azygos veins. In the third case the stenosis of the vena cava was caused by mediastinal Hodgkin's disease, which also compressed the right subclavian and innominate veins and occluded the left innominate vein, producing collateral circulation by way of the hemiazygos system. The vena cava of the next patient, who had a substernal goiter, was not involved, but instead there was stenosis of the right innominate vein and complete occlusion of the left one. The last person exhibiting the superior vena caval syndrome had dilatation of the superior vena cava and of the innominate veins and no demonstrable point of obstruction. Necropsy, however, showed that the pulmonary veins and the left atrium were obstructed by metastases from a primary carcinoma of the right bronchus.

In another case a huge teratoma caused displacement of the superior vena cava and stenosis of the left innominate vein, producing collateral circulation by way of the cervical vessels. At operation the tumor was found to be firmly attached only at the site of stenosis, and here troublesome hemorrhage followed its removal. The last patient had a deformity of the superior vena cava, displacement of the pulmonary artery to the left and compression of its right branch by tuberculous lymph nodes in the paratracheal and the right hilar regions.

14. Robb, G. P., and Steinberg, Israel: Visualization of the Chambers of the Heart, the Pulmonary Circulation, and the Great Blood Vessels in the Normal; Preliminary Study, to be published.

15. Steinberg, Israel, and Robb, G. P.: Mediastinal and Hilar Angiography in Pulmonary Disease: A Preliminary Report, *Am. Rev. Tuberc.* 38: 557 (Nov.) 1938.

16. Robb, G. P., and Steinberg, Israel: Visualization of the Chambers of the Heart, the Pulmonary Circulation, and the Great Blood Vessels in Heart Disease; Preliminary Observations, *Am. J. Roentgenol.* 42: 14 (July) 1939; Visualization of the Heart and the Thoracic Blood Vessels in Pulmonary Heart Disease: A Case Study, *Ann. Int. Med.* 13: 12 (July) 1939.

17. Steinberg, Israel, and Robb, G. P.: A Visualization Study of the Cardiovascular Structures, *Radiology* 33: 1 (Jan.) 1939; Steinberg, Robb and Roche (footnotes 20 and 21).

Heart Disease.—Characteristic changes were observed in heart disease. In congenital heart disease direct visualization of the abnormal communication has not yet been possible in interatrial septal defect, interventricular septal defect and patent ductus arteriosus. However, convincing evidence of its presence in the first and last disorders was provided by the recirculation of blood

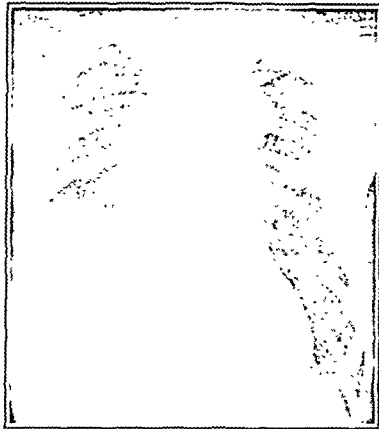


Fig. 1 (O. C., aged 62).—Malignant mediastinal neoplasm. Conventional roentgenogram, frontal position. Note widening of mediastinum, irregularity of right supracardiac border, infiltration of right lung with fluid at base and metastatic nodule underlying third left rib anteriorly.

of the descending aorta, the aortic constriction, the aneurysm and the rich collateral circulation by way of the innominate, the subclavian and the lateral thoracic arteries were visualized.¹⁰

The following observations were made on the twenty patients with rheumatic heart disease, mitral insufficiency and mitral stenosis: 1. The right ventricle was enlarged, owing to dilatation and hypertrophy of the inflow tract, and elongation and widening of the outflow tract. 2. The pulmonary artery was dilated and alone produced the prominent pulmonary arc in the frontal view; the conus arteriosus formed no part of it. 3. The accentuated hilar and parenchymal shadows were caused by engorged pulmonary blood vessels, and the pulmonary veins, not the left atrium, produced the elevation and stenosis of the left bronchus. 4. The left atrium was enlarged predominantly toward the right; the main body never reached to the left cardiac border in the frontal view, although its auricula not infrequently was visible below the pulmonary arc.

Three different types of syphilitic cardiovascular disease have been studied in eighteen cases: aortitis, aneurysm of the aorta and aortic insufficiency with left ventricular enlargement and dilatation. In the five cases of aortic insufficiency without circulatory failure there was generalized aortic dilatation most marked in the ascending aorta, and marked dilatation and hypertrophy of the left ventricle. Aneurysm of the aorta was demonstrated in eight instances, in three of which it had previously been unrecognized. In one unusual case, two aneurysms were discovered: the first one a fusiform dilatation of the ascending aorta, and the second a saccular aneurysm of the descending aorta. In six cases presenting syphilis, hypertension and widening of the supracardiac shadow, dilatation of the aorta was excluded and the apparent dilatation shown to be due

to enlargement of the aortic arch from "uncoiling" in two instances, while aortic aneurysm was proved in the remainder. Rounded shadows at the left hilus had been diagnosed as aortic aneurysm and neoplasm respectively in two cases of syphilis, but instead they were found to be aneurysms of the pulmonary artery and its main branches (figs. 3, 4 and 5).

In our eleven cases of hypertensive heart disease without cardiac failure there were moderate enlargement of the left ventricular cavity and wall and varying degrees of tortuosity, "uncoiling" and dilatation of the aorta. In one case these changes in the aorta were sufficiently marked to warrant the roentgenographic diagnosis of aneurysm, although it was later established by visualization that the prominence of the ascending aorta was due primarily to "uncoiling," in small part to dynamic dilatation. The arteries arising from the arch were generally found to be dilated and tortuous, and in one instance "buckling" of the innominate artery was discovered.

There was little demonstrable cardiac change but a pronounced degree of aortic disease in the eight cases of arteriosclerotic cardiovascular disease in which there had been neither hypertension, circulatory failure nor coronary thrombosis; the arteriosclerotic aorta was characterized by calcification and thickening of the wall, widening of the aortic arch due to elongation and "uncoiling," and elevation of the arch. By visualizing the lumen it was possible to demonstrate the intimal location of the aortic calcification and thereby verify the fact that the shadow which we had previously attributed to the aortic wall actually represented it.



Fig. 2 (O. C.).—Malignant mediastinal neoplasm. Contrast roentgenogram, frontal position, three and one-half seconds after beginning of injection. Axillary, subclavian and innominate veins, superior vena cava, right atrium, right ventricle with conus arteriosus, pulmonary artery and main branches opaque. Collateral circulation around shoulder girdle, intercostal veins, right internal mammary and azygos vein also outlined. Note irregularity and displacement of innominate vein and reversed direction of blood flow through the azygos, internal mammary and intercostal veins, indicated by arrows. In these illustrations IV indicates innominate vein; ALV, azygos vein; SVC, superior vena cava; RA, right atrium; RV, right ventricle; PA, pulmonary artery; RPA, right pulmonary artery; LPA, left pulmonary artery.

There was generalized cardiac enlargement and a large aneurysm of the left ventricle in our one patient who had had myocardial infarction previously. Although the inside of the aneurysmal sac could not be visualized, probably because it was filled with clotted blood, the left ventricular cavity was dilated and the ventricular wall from the aneurysm to the apex was extremely thin.

There were two cases of chronic constrictive pericarditis. In the first case in which there was auricular fibrillation, the pericardium had been partially resected previously with temporary improve-

ment, but because peripheral circulatory failure had recurred constriction of the pulmonary artery or of the pulmonary conus was suspected. Visualization, however, showed no stenosis but instead dilatation of the right ventricle and the left atrium, so that further

surgery was obviated. In the second case cirrhosis of the liver or constrictive pericarditis was suspected. Tremendous enlargement of the innominate vein and the superior vena cava and pronounced slowing of the blood flow into the heart supported the latter diagnosis, which was subsequently confirmed at operation and necropsy. Tuberculous pericarditis with effusion was suspected in another case, but the diagnosis could not be confirmed because there was no evidence of cardiac tamponade or failure; the electrocardiogram was normal and the roentgenkymogram and the pericardial tap were inconclusive. The presence of an effusion was proved beyond reasonable doubt, however, by demonstration of the normal size of the cardiac chambers and the tremendous thickening of the surrounding cardiac shadow.

Lung Disease.—Cardiovascular changes were also found in pulmonary disease. In our thirty-nine cases of tuberculosis the changes in the pulmonary circulation consisted of three main types: (1) diminished vascularity resulting from the narrowing and obliteration of blood vessels in the exudative tuberculosis and by the fibrosis in the productive type, (2) gross displacement of the intrathoracic cardiovascular structures

cases presenting advanced bronchiectasis, and there was also a striking decrease in the blood supply to the diseased area. In both bullous (two cases) and generalized emphysema (seven cases) there was diminished vascularity to the involved regions. The main branches of the pulmonary artery at the hili and in the lower lobes were enlarged, forming the so-called moustache, while in the midzone and outer zones, the vessels became small and wirelike. In five instances of primary carcinoma of the bronchus there was a decrease in the size and number of the blood vessels to the affected lobes. This, we believe, was due either to obliteration of the vessels by the suppurative process or to narrowing of the lumen from compression by the primary tumor or from metastases to neighboring lymph glands.

COMMENT

Our method of visualizing the anatomy of the heart and the thoracic blood vessels is unique, differing from preceding attempts in the completeness with which the cardiovascular structures are revealed and in the specialized technics used to secure opacification and roentgenography. These technical procedures are largely the result of applying a practical knowledge



Fig. 3 (A. W., aged 57).—Aneurysm of pulmonary artery, syphilis, silicosis. Note generalized mottling due to silicosis particularly prominent at the bases, small bulla at right apex with fibrotic strands extending below first rib anteriorly, fracture of fifth rib posteriorly and prominent rounded mass at left hilus. Moderate increase in transverse diameter of heart and of aortic arch. (From the Tuberculosis Service of Bellevue Hospital.)



Fig. 4 (A. W.).—Aneurysm of pulmonary artery; syphilis; silicosis. Contrast roentgenogram at four and one-half seconds. Superior vena cava, right atrium, right ventricle, pulmonary artery, right pulmonary artery and left pulmonary artery and their branches opaque. Note aneurysm of pulmonary artery with enlargement of both branches, particularly the left, accounting for double bulge at hilus in conventional roentgenogram. Hilus subdivision increased in size and prominence, whereas vessels in outer and midzones are decreased, characteristic of pulmonary fibrosis.



Fig. 5 (A. W.).—Aneurysm of pulmonary artery and main branches; syphilis; silicosis. Contrast roentgenogram, left anterior oblique position at five seconds. Superior vena cava, right atrium and pulmonary artery with right and left branches filled. Note dilatation of pulmonary artery and right branch (seen on end) and enormous aneurysm of left branch filling aortic window.

by extensive pulmonary fibrosis ("fibrothorax"), and (3) displacement and stenosis of the pulmonary artery by tuberculous adenitis. The cardiovascular changes occurring in "fibrothorax" and the impossibility of recognizing them without visualization are demonstrated in figures 6, 7 and 8. In the conventional roentgenogram the heart and the great vessels could not be distinguished at all, but with visualization these structures and their gross anatomy were outlined. Following pneumothorax in thirteen cases and thoracoplasty in six others, changes in both the peripheral vascular tree and the larger arterial divisions occurred, consisting mainly of avascularity of the collapsed lobes and displacement and rotation of the pulmonary artery and its branches at the hilus.²⁰

Enlargement of the right ventricle and the pulmonary artery with its branches was observed in the three

of the anatomy and the physiology of the circulation to the field of contrast cardiac roentgenography.

We believe that our method of cardiovascular visualization is sound in principle and that it is now past the experimental stage. No serious effect has followed 486 injections in 233 cases, although mediastinal, heart or lung disease was present in the majority. The reaction to the injection is slight, and the organic iodide compound diodrast is promptly eliminated by the kidneys without change. The procedure does not require costly new apparatus and so can be performed in the average x-ray laboratory. The patients may be ambulatory, since after-care is unnecessary. Contrary to earlier opinion, we now believe that the procedure is more difficult to perform than most diagnostic tests. The technic is exacting, requiring dexterity, precision, speed, team work and strict adherence to detail. Proficiency in the procedure however, can be readily acquired through training and practice, and successful performance should be within the capability of every medical center.

20. Steinberg, Israel; Robb, G. P., and Roche, U. J.: A Visualization Study of the Circulatory Changes Resulting from the Collapse Therapy of Pulmonary tuberculosis, to be published.

Cineroentgenography of the heart and the thoracic blood vessels during opacification²⁵ has recently been carried out and shows graphically the cardiovascular anatomy, the changes occurring with the heart beat and the course and the velocity of the blood flow. Roentgenkymography during opacification²⁶ has been of value in identifying the structures causing external cardiovascular pulsations and in demonstrating intracardiac motion. By its use greater accuracy in measuring the cardiac output by roentgenkymography²⁷ should be possible because the true cardiac border can be defined and both ventricles visualized.

Detailed cardiovascular visualization has already proved its worth in clinical medicine and in the teaching of medicine and the anatomy, pathology and physiology of the circulation. A summary of its value in mediastinal, heart and lung diseases was given in the preceding section. By its use the mediastinal contents are divided in two main groups—the vascular and the nonvascular structures. Then the various components of the cardiovascular system are identified, and the location and the degree of gross abnormality ascertained. Nonvascular disorders such as neoplasm, cyst and tuber-

mass. This method of delineation is illustrated by figures 1 and 2.

In cardiovascular disease, this method has given a degree of precision in diagnosis previously unattainable. The single cardiac silhouette has been divided into its four constituent chambers, and blood vessels previously seen indistinctly have become visible. As a result, surmise regarding the chambers of the heart, the pulmonary circulation and the great vessels during life can be replaced largely by fact. The size, the shape and the location of each gross anatomic division can be determined and the site and the degree of abnormality ascertained. Instead of using arbitrary diameters in cardiac mensuration which frequently have no anatomic counterpart, one can now measure the actual length, depth and breadth of the heart and, more important, the dimensions of the chambers, the thickness of their walls and the diameter and length of the large blood vessels. Determination of the volume of the heart should consequently be more accurate. It is even conceivable that a practical index of the cardiac



Fig. 6 (J. D., aged 20).—Massive unilateral pulmonary fibrosis ("fibrothorax") due to tuberculosis. Conventional roentgenogram. Entire left side of chest obscured by extensive pulmonary tuberculosis. Note cavities below clavicle, displacement of trachea and other mediastinal structures, and impossibility of distinguishing heart. Right side of chest clear save for productive tuberculosis at right apex and first interspace. (From the Tuberculosis Service of Bellevue Hospital.)



Fig. 7 (J. D.).—Tuberculous "fibrothorax." Contrast roentgenogram three seconds after beginning of injection. Entire right side of heart visualized: left cephalic, axillary, subclavian and innominate (in part) veins, superior vena cava, right atrium, right ventricle, pulmonary artery, right pulmonary artery and branches are opaque. Left subclavian and innominate veins (indicated by white arrow) kinked and foreshortened, and superior vena cava displaced to left of spine. Entire heart rotated toward left axilla, giving view ordinarily seen in right anterior oblique position of thorax. Two pulmonic cusps and sinuses are indicated by outer black arrow. Note dwarfed receding left branch of pulmonary artery seen on end (upper black arrow) and avascularity of left lung, contrasting strikingly with normal right pulmonary artery and rich vascular network of right lung.



Fig. 8 (J. D.).—Tuberculous "fibrothorax." Contrast roentgenogram at eight seconds. Entire left side of heart visualized: left atrium (LA), left ventricle (LV), entire thoracic aorta (Ao), with its branches from arch, and abdominal aorta are opaque. Note two cusps and corresponding sinuses of aortic valve and innominate artery (AI) dividing into right common carotid and subclavian branches; on the left side left common carotid and more medial left vertebral arteries are indicated by vertical arrows and left subclavian and axillary arteries by horizontal arrow.

culous adenitis can be detected or better defined by the vascular derangement they produce. Most frequently there has been compression and displacement of the superior vena cava and the innominate veins, but the pulmonary blood vessels, the aorta and the heart have also been involved. By knowing the points of involvement of the cardiovascular system, which extends widely through the superior, the middle and the posterior parts of the mediastinum, one can map out the approximate size and configuration of the mediastinal

weight may ultimately be obtained by subtracting the combined volumes of the chambers from the total cardiac volume and multiply-

ing the result by the average specific gravity of the heart. Finally, the circulation time to each major subdivision of the intrathoracic cardiovascular system can be measured objectively, and with the same injection the peripheral arterial rate of blood flow²⁹ can be determined subjectively by the sensation of heat that spreads throughout the body.

The most striking results are obtained in disorders such as aneurysm of the pulmonary artery, aortic disease, pericardial and congenital abnormalities in which recognition is difficult or impossible with conventional methods of study. The importance of accurate diagnosis in such cases becomes apparent when one realizes

25. Stewart, W. H.; Robb, G. P.; Steinberg, Israel; Roche, U. J., and Breimer, C. W.: Cineroentgenoscopy of the Chambers of the Heart, the Pulmonary Circulation and the Great Blood Vessels, read before the fortieth annual meeting of the American Roentgen Ray Society, Chicago, Sept. 19-22, 1939; to be published.

26. Robb, G. P.; Steinberg, Israel; and Stewart, W. H.: Contrast Roentgenkymography of the Heart, to be published.

27. Keys, Ancil, and Steinberg, H. L.: Measurement of the Stroke Volume of the Human Heart by Simultaneous Roentgenkymographic and Aortic Catheterization Experiments, *Am. J. Physiol.* 126:741 (July) 1944. Steinberg, H. L., and Gubner, Richard: Teleroentgenkymography in the Determination of the Size of Heart Size, Output and Aortic Flow, *Am. J. Physiol.* 122:47 (Oct.) 1939.

29. Spier, L. C.; Wright, I. S., and Saylor, Leslie: A New Method for Determining the Circulation Time Throughout the Vascular System, *Am. Heart J.* 12:511 (Nov.) 1936.

that excision of an aneurysm of the pulmonary artery wrongly diagnosed as neoplasm has been attempted,³⁰ once with fatal results.³¹ Likewise, the differentiation of neoplasm and aortic aneurysm is of vital importance in the presence of bronchostenosis and pulmonary suppuration, because excision or irradiation may be indicated in the first case and antisiphilitic treatment and wiring of the aneurysm³² in the second one. Another use may be the exclusion of other congenital lesions of patients with patent ductus arteriosus for whom ligation of this vessel is proposed.³³

In the lungs, visualization reveals intrinsic abnormality of the pulmonary blood vessels and also the changes caused by pulmonary disease. The greatest value of this method is in disorders near the hilus, which are notoriously difficult to diagnose. Enlarged lymph nodes, cysts and neoplasms can be differentiated from the hilar blood vessels and a clearer idea of their location and configuration gained from the vascular compression and displacement which they produce. Aneurysms of the pulmonary arterial tree can now be distinguished with certainty and differentiated from the nonvascular mass with transmitted pulsation which may simulate aneurysm. Rounded opacities not infrequently mistaken for calcified lymph nodes are shown to be arteries seen on end.

The diagnosis of parenchymal disease can usually be made by ordinary methods of study; but even in these obvious disorders we have found visualization worth while, for it brings out strikingly the pathologic changes in the pulmonary circulation and so presents a clearer picture of the primary disease. In cases of tuberculosis, fibrosis, emphysema, chronic pulmonary suppuration, cyst or neoplasm there is a decrease in the vascularity to the involved regions, while in other portions there appears to be an increase in the size and number of blood vessels (figs. 6, 7 and 8). This method has been of no value in the diagnosis of early tuberculosis or cavitation. It may, however, reveal the presence of hilar or mediastinal metastases too small to be detected otherwise in a case of primary carcinoma of the bronchus and so prove the case inoperable. In many instances of so-called peribronchial fibrosis the lung markings were shown to be due to normal pulmonary blood vessels instead of disease, and the increased lung markings in mitral stenosis and left ventricular failure which may be mistaken for tuberculosis or fibrosis are primarily due to dilatation of the pulmonary blood vessels.

In undergraduate and postgraduate teaching, the chief value of the method lies in its application to the basic sciences of anatomy, pathology and physiology and to the clinical subjects of roentgenology and medicine. In the past, the gross anatomy and pathology of the cardiovascular system have been taught chiefly by anatomic dissection and postmortem roentgenographic studies in which there has necessarily been great distortion. For this reason it has been difficult for the student to form a true picture of the heart and the blood vessels during life and to understand their relationships to one another and to adjacent organs. The use of contrast roentgenograms showing the loca-

tion, size and shape of the superior vena cava and its tributaries, the chambers of the heart, the walls and the valves, the pulmonary blood vessels and the aorta with its branches in health and in disease would simplify and enrich the teaching of these subjects. Contrast roentgenography likewise opens a new field for the study of cardiovascular physiology which heretofore has been based chiefly on animal experimentation supplemented by such indirect studies in man as electrocardiography, roentgenography and measurement of venous and arterial blood pressures and of the rate of blood flow. Now, however, both internal and external cardiac motion and the vascular pulsations occurring in the cardiac cycle can be studied in both animal and man.

The knowledge gained by this method will be useful for the instruction of the general practitioner as well as the specialist in roentgenology, heart disease and diseases of the chest. To the busy practitioner with limited time for postgraduate study, this method not only simplifies roentgenographic interpretation but also shows him gross pathologic changes in the living and so enables him to obtain a grasp of the fields of cardiac and pulmonary diseases which were previously beyond his reach. Since the use of fluoroscopy is becoming general, a knowledge of the structures responsible for the cardiovascular and pulmonary shadows in health and disease is necessary if errors are to be avoided and the maximal value of this diagnostic procedure secured. To the specialist, visualization offers a unique method of learning the anatomy and the pathologic conditions of the cardiovascular system by the study of roentgenograms showing normal structure and the changes in disease, supplemented by visualization studies of his own patients presenting diagnostic problems. Although roentgenology has long been known as "pathology in the living," it has heretofore given an inadequate insight into the condition of the heart and of the thoracic blood vessels. Now this term is more truly applicable in thoracic disease because contrast roentgenography reveals the gross anatomy of the heart and of the thoracic blood vessels, which previously could be learned only at necropsy.

SUMMARY AND CONCLUSIONS

Our method of visualizing the chambers of the heart, the pulmonary circulation and the great blood vessels in man consists of two parts: (1) the rapid intravenous injection of enough radiopaque solution (diodrast 70 per cent) to make the interior of the heart and of the thoracic blood vessels opaque to the roentgen ray, and (2) roentgenography of these structures at the time of their opacification. Specialized technics are necessary in both opacification and roentgenography.

The method is safe and practical. No serious consequence has followed 486 injections of 233 patients, many of whom were seriously ill. The usual reaction to the injection is mild and transient, and severe reactions are rare. The compound diodrast has negligible toxicity and is excreted rapidly and completely by the kidneys. This procedure does not require expensive new apparatus and can be performed in the average roentgenographic laboratory. Success demands a high degree of teamwork and precision and rigid adherence to the technic in all details.

The following conclusions seem warranted:

1. Our method of visualizing the chambers of the heart, the pulmonary circulation and the great blood vessels in man is safe and practical.

30. Boyd, L. J., and McGavack, T. H.: Aneurysm of the Pulmonary Artery: A Review of the Literature and Report of Two New Cases, *Am. Heart J.* 18: 562 (Nov.) 1939.

31. Wahl, H. R., and Gard, R. L.: Aneurysm of the Pulmonary Artery, *Surg., Gynec. & Obst.* 52: 1129 (June) 1931.

32. Blakenmore, A. H., and King, B. G.: Electrothermic Coagulation of Aortic Aneurysms, *J. A. M. A.* 111: 1821 (Nov. 12) 1938.

33. Gross, R. E., and Hubbard, J. P.: Surgical Ligation of a Patent Ductus Arteriosus, *J. A. M. A.* 112: 729 (Feb. 25) 1939. Gross, R. E.: *New England J. Med.* 220: 510 (March 23) 1939.

2. It provides vital information regarding these structures and other thoracic organs not obtainable by any other means.

3. This information is of practical value in the diagnosis, the prognosis and the treatment of mediastinal, heart and lung diseases.

477 First Avenue.

THE SYNERGISM OF PHENOBARBITAL, DILANTIN SODIUM AND OTHER DRUGS

IN THE TREATMENT OF INSTITUTIONAL EPILEPSY

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Pharmacologically the history of the treatment of epilepsy may be divided into several epochs. The first, which was inaugurated in 1853, lasted until the introduction of phenobarbital and may be called the era of the bromide treatment. Bromides undoubtedly reduced the epileptic attacks but on the whole did not represent a very efficient form of therapy, and their effective use was hindered by the frequent occurrence of bromidism.

The second era came with the introduction of phenobarbital in 1912. The profession recognized that this drug was more successful than bromides in the treatment of epilepsy, and in a short time bromides receded to a position of secondary importance.

The third era is very recent in origin and is characterized by the introduction in 1938 of dilantin sodium by Merritt and Putnam,¹ whose work established the specific value of this drug.

It is certain that there is no unified condition which can be called epilepsy. It has long been known that the convulsive syndrome not only comes without known cause (the so-called idiopathic epilepsy) but is often a concomitant of infectious diseases, kidney damage and organic disease of the brain due to such conditions as syphilis, arteriosclerosis and brain tumor. In other words, there are various avenues of causation. On a theoretical basis, therefore, there should be different avenues of therapeutic approach, and even where the etiology is unknown it seemed to us that a synergistic approach to the pharmacologic treatment of epilepsy would be of value.

EXPERIENCE WITH PHENOBARBITAL

Phenobarbital Alone.—At the beginning of this research, over two years ago, the patients who were institutionalized at the Grafton State Hospital were treated almost entirely with phenobarbital in what we now recognize to have been inadequate dosage. By what we call "central control," namely the handling of all patients by a few physicians rather than by the individual physicians in charge of their respective services.

Read at the twenty-ninth annual meeting of the American Psychopathological Association, Atlantic City, N. J., June 5, 1939.

Parke, Davis & Co. furnished the dilantin sodium used in these experiments; Smith, Kline & French Laboratories supplied the amphetamine sulfate.

From the Grafton State Hospital, North Grafton, Mass., and the Division of Psychiatric Research, Boston State Hospital, aided by grants from the Commonwealth of Massachusetts and the Rockefeller Foundation.

1. Merritt, H. H., and Putnam, T. T.: Sodium Diphenyl Hydantoinate in the Treatment of Convulsive Disorders, *J. A. M. A.* 111: 1068 (Sept. 17) 1938.

the dosage of phenobarbital was raised in each case in accordance with the number and the time of occurrence of the epileptic attacks.

Such increases in dosage were made until it was evident in each case that phenobarbital had reached the limit of usefulness and that further increase could not reduce seizure incidence. By this use of phenobarbital alone we were able to effect improvement in 89 per cent of all patients treated, with a total seizure reduction of 68 per cent.

The average daily dose of phenobarbital used was 2.9 grains (0.188 Gm.) per patient, ranging from 1.0 to 8.0 grains (0.06 to 0.52 Gm.) a day. Detailed results of this treatment have been published elsewhere.² We recapitulate some of the observations in order to compare them with the effects of the synergistic treatment to be described later.

We had observed that epileptic patients show individual rhythms with fair constancy: annual seizure rates (under unchanged medications) tended to approximate one another, and loads of seizures seemed to favor set periods of the day. Accordingly after data were reviewed each week or two the dose of phenobarbital immediately prior to the individual seizure peak was increased by from one half to 1 grain (0.03 to 0.06 Gm.) until it was evident that further increase was without benefit. In this way we achieved what we conceived to be the most favorable therapeutic levels with phenobarbital.

The following remarks may be made about the use of phenobarbital in epilepsy: Phenobarbital appears to exercise diffuse antiepileptic effect with benefits manifested in every hour period of the day even though it is given only a few times daily. This is probably due to accumulation of the drug in the body and its gradual excretion, the reservoir level being maintained by continued medication.

It appears from our studies that there is an optimal dosage of phenobarbital beyond which no benefit is obtained by increasing the dosage. When administered to patients who are inadequately treated, it exerts a rapid and sustained beneficial effect. As the level of dosage is raised arbitrarily, most of these patients tolerate the drug without untoward effect but additional antiepileptic benefit is not observed.

This point is demonstrated in table 1 by the record of twenty patients whose expectancy of seizures on the basis of the previous two years was 427 in ten weeks.

We find no support for the opinion so far expressed to the effect that the dose of phenobarbital must be regularly increased in order to obtain therapeutic benefits. Our observations, as presented in table 2, involve thirty unselected cases over four periods of ten weeks each, during which the dosage of the drug remained unchanged.

Toxicology of Phenobarbital and the Use of Amphetamine (Benzedrine) Sulfate.—We wish to present certain facts on the toxicology of phenobarbital and the value of amphetamine sulfate in its treatment. Toxic symptoms were surprisingly low in this group of patients. Of the 144 patients under treatment in this series, seventy-two received daily totals of 3 grains (0.2 Gm.) or more of phenobarbital daily. Of this series one case presented symmetrical dermatitis of the hands which disappeared within two weeks when the drug was discontinued and reappeared when medication was

2. Cohen, Benjamin, and Myerson, Abraham: The Effective Use of Phenobarbital and Benzedrine Sulfate (Amphetamine Sulfate) in the Treatment of Epilepsy, *Am. J. Psychiat.* 95: 371-393 (Sept.) 1938.

resumed. There were nineteen cases of drowsiness, in some instances with associated unsteadiness or functional ataxia. This unsteadiness was associated with drowsiness and a feeling of dizziness and does not represent true ataxia. So far as we know, there are no ways of predicting which patients will show drowsiness or unsteadiness. Despite the fact that phenobarbital is excreted by the kidneys and impaired kidney function might be expected to produce phenobarbital poisoning,³ we found no such correlation in our series.

That the toxic symptoms are due to some idiosyncrasy is indicated by table 3, which shows that they occur without definite relationship to the dosage.

In our previous paper we pointed out that amphetamine sulfate is valuable in counteracting the drowsiness and unsteadiness of phenobarbital. One of the main characteristics of this drug is its effect on drowsiness and sleep. It effectively dissipates the drowsiness and sleepiness of phenobarbital without in any way affecting the epileptic attacks, although in one instance it seems to have exerted a favorable influence. In general it may be stated that it neither increases nor decreases the epileptic attacks by itself.

On the basis of this action of amphetamine sulfate, we administered it in doses of from 5 to 25 mg. daily to patients who showed drowsiness with or without unsteadiness. Although phenobarbital dosage remained unchanged, the drug cleared up these symptoms in most cases within a day.

In order to determine the safety of such supplementary medication, we continued administration of amphetamine sulfate for an average period of seventeen weeks. The results, so far as attacks were concerned, were practically unchanged, although the group as a whole improved markedly with regard to drowsiness and general alertness. One patient, who had been receiving 5 grains (0.32 Gm.) of phenobarbital a day without benefit, improved markedly after amphetamine medication was started (table 4).

During the past forty-two weeks this patient has not been receiving amphetamine, and her seizure incidence in this period has been 0.1 seizure per week.

TABLE 1.—Effects of Mounting Phenobarbital Dosage

Time, Ten Week Period	Average Daily Dose of Phenobarbital, Grains	Total Seizures in Ten Weeks
1st.....	2.3	118
2d.....	3.2	108
3d.....	3.6	97
4th.....	3.7	100
5th.....	3.8	102

TABLE 2.—Effect of Unchanged Phenobarbital Dosage

Time, Ten Week Period	Total Seizures
1st.....	91
2d.....	67
3d.....	79
4th.....	73

Most of our patients lost weight, the loss ranging between 3 and 19 pounds (1.3 and 8.6 Kg.), the average being 6½ pounds (2.9 Kg.). The weight loss occurred during the period of amphetamine medication, which averaged seventeen weeks.

To summarize, amphetamine sulfate is of real value in the treatment of the drowsiness and unsteadiness

consequent on phenobarbital medication. The dosage of phenobarbital may be maintained during the period of amphetamine medication, and thus the penalty of increased attacks attendant on discontinuing phenobarbital or lessening its dosage is avoided. Another point which bears on the hypothesis raised by Merritt

TABLE 3.—Relationship Between Phenobarbital Dosage and Incidence of Toxic Features

Daily Amount of Phenobarbital, Grains	Number of Patients Receiving This Dose	Number of Patients Showing Drowsiness With or Without Unsteadiness
1½	16	2
2	26	4
3	20	3
3½	11	2
4	11	2
4½	12	2
5	8	2
5½-7	10	2

TABLE 4.—Apparent Reduction of Seizures by Supplementary Amphetamine Sulfate in a Patient Refractory to Phenobarbital

Daily Medication		Number of Weeks	Seizures per Week
Phenobarbital, Grains	Amphetamine, Mg.		
5	0	7	10.8
5	10	8	1.8
5	20	27	0.07

and Putnam is pertinent at this time. It is apparently not the hypnotic effect of phenobarbital which is of value in the treatment of epilepsy, since this hypnotic effect may be eliminated by the use of amphetamine, and yet the seizure incidence is favorably affected.

DILANTIN SODIUM

In 1938 Merritt and Putnam described the value of dilantin sodium, a derivative of glycolyl urea, in the treatment of epilepsy in patients who derived little or no benefit from the usually accepted treatments (with bromides, phenobarbital, ketogenic diet, restricted fluid intake and other means). Using doses ranging from 0.3 to 0.6 Gm. a day for 142 patients, they found that the attacks were completely relieved in 58 per cent and greatly decreased in frequency in an additional 27 per cent.

Our studies of the effect of this drug may be divided into two parts, with (1) dilantin sodium replacing phenobarbital and (2) dilantin sodium and phenobarbital in combination.

Dilantin Sodium Replacing Phenobarbital.—Eighteen patients who were receiving optimal doses of phenobarbital were given supplementary dilantin sodium for five weeks. The amount of phenobarbital received was unchanged during this time.

It will be observed in table 5 that during the preceding five weeks (when they received phenobarbital alone) the total number of seizures was forty-one; while in the five weeks in which they received supplementary dilantin sodium they had nineteen seizures, a reduction of 54 per cent. Five patients were improved under supplementary dilantin sodium medication (total decrease of twenty-eight seizures mainly due to benefit in two of these patients); four patients had more seizures (total increase of only six seizures), and nine

3. Weiss, Soma: The Clinical Use and Dangers of Hypnotics, J. A. M. A. 107: 2104 (Dec. 26) 1936.

patients, who were free from seizures with phenobarbital alone, remained seizure free after dilantin sodium had been added.

In the succeeding three weeks phenobarbital for this group was gradually discontinued entirely; then

TABLE 5.—Effect of Addition of Dilantin Sodium to Existing Phenobarbital Medication

Patient	Seizures with Phenobarbital Alone, First 5 Week Period	Seizures with Phenobarbital and Dilantin Sodium, Second 5 Week Period
H. B.	0	0
J. B.	0	0
C. C.	0	0
W. D.	2	0
P. D.	0	0
L. F.	0	0
D. H.	0	0
W. K.	1	3
D. L.	25	8
A. L.	0	1
M. L.	0	0
M. R.	0	0
S. R.	0	2
J. W.	6	4
H. W.	0	0
S. B.	6	0
M. G.	1	0
M. S.	0	0
Total.....	41	19

followed twenty weeks when dilantin sodium was administered, the maximal dose being six capsules (each containing 0.1 Gm. of the drug) daily for each patient.

It will be noticed in table 6 (which compares seizure totals in this twenty week period with those in the preceding period of twenty weeks with phenobarbital alone) that dilantin sodium is an inadequate substitute for adequate phenobarbital. In the twenty weeks in which these patients received dilantin sodium alone they had a total increase of 203 seizures as compared with the number of seizures when they received pheno-

TABLE 6.—Effect of Total Replacement of Phenobarbital by Dilantin Sodium as Indicated by Seizure Totals

Patient	Comparison of Periods of 20 Weeks Each	
	Seizures with Phenobarbital Alone	Seizures with Dilantin Sodium Alone
H. B.	5	23
J. B.	0	1
C. C.	0	6
W. D.	4	28
P. D.	2	0
L. F.	0	2
D. H.	4	5
W. K.	6	28
D. L.	138	220
A. L.	1	1
W. L.	10	16
W. R.	1	6
S. R.	0	6
J. W.	21	19
H. W.	3	2
S. B.	5	12
M. B.	7	34
M. S.	2	3
Total.....	209	412

barbital alone: Four patients who had been seizure free while given phenobarbital had a total of fifteen seizures in the twenty week period while they were receiving dilantin sodium alone. Fourteen patients (including the four already mentioned) had more seizures with dilantin sodium (total increase of 208 seizures in twenty weeks with dilantin sodium alone). One patient had one seizure in each of these periods. Three had fewer

seizures (total decrease of five seizures) with dilantin sodium alone than with phenobarbital alone.

The next step was return of these patients to phenobarbital medication. All these patients continued to receive six capsules (0.1 Gm. each) of dilantin sodium daily. When two successive periods of seven weeks each were subsequently compared it was found that resumption of phenobarbital medication effected improvement in ten cases with a total decrease of 239 seizures; five patients who had been seizure free with dilantin sodium remained seizure free, and two patients were unaffected. None showed untoward results. The total reduction of seizures effected by the addition of phenobarbital to existing dilantin sodium therapy was 89 per cent. The greatest change was noted in patient A. L., whose seizures dropped from 166 to seven. With his data excluded from the totals it is found that the remainder of the group experienced 79 per cent reduction of seizures. Details are recorded in table 7.

Dilantin Sodium and Phenobarbital (Twenty-Three Patients).—This phase of our study with a separate group of patients confirms the existence of synergism between phenobarbital and dilantin sodium.

TABLE 7.—Effect on Seizures of the Restoration of Phenobarbital to Patients Receiving Dilantin Sodium

Patient	Comparison of Two Successive Periods, 7 Weeks Each	
	Seizures with Dilantin Sodium Alone	Seizures with Dilantin Sodium and Phenobarbital
H. B.	6	2
J. B.	0	0
W. D.	26	6
P. D.	0	0
L. F.	2	0
D. H.	1	0
W. K.	24	7
D. L.	166	7
A. L.	0	0
M. L.	2	0
M. R.	3	0
S. R.	3	0
J. W.	2	2
H. W.	1	1
S. B.	0	0
M. G.	29	3
M. S.	0	0
Total.....	267	28

The patients in this series were receiving heavy doses of phenobarbital and it was evident that additional increases of this drug would be without benefit. Consequently the phenobarbital dosage was retained without change and supplementary dilantin sodium was used.

The average period during which supplementary dilantin sodium was used was twenty-five weeks. The average dose of phenobarbital per patient was 4 grains (0.26 Gm.). The average maximum dose of dilantin sodium was 0.3 Gm. (4½ grains) daily. The total number of seizures during the period of phenobarbital plus dilantin sodium was 330 by direct count and the total number of seizures in an exactly equal period while patients were receiving phenobarbital without dilantin sodium was 662. The reduction of seizures by the added dilantin sodium amounted to 50 per cent and twenty-two of the twenty-three patients in this series showed improvement. These data are in agreement with those observed in the first part of this study, when the administration of dilantin sodium in addition to the existing phenobarbital medication over a period of five weeks reduced the total seizure incidence 50 per cent.

It will also be noted that our clinical results with a combination of phenobarbital and dilantin sodium were far superior to those observed when dilantin sodium was used alone (although the maximum dose of dilantin sodium in the latter instance was 0.6 Gm. a day in contrast to an average maximal dose of 0.3 Gm. in the former instance). Individual and group data are listed in detail in table 8.

Toxicology of Dilantin Sodium.—Most of the toxic features observed occurred in the group of patients for whom replacement of phenobarbital by a maximum dose of 0.6 Gm. of dilantin sodium daily was attempted.

One patient refused further dilantin sodium after a short trial, saying "It dazed me, upset my stomach as though I had indigestion and made me dozey all the time." (He was dropped from the study.) Five of the forty-one patients who received dilantin sodium became drowsy and unsteady after dilantin sodium dosage had reached its peak, and bed care became necessary. Medication consisted of administering from 30 to 40 mg. of amphetamine sulfate in divided doses over a period of two days. In most cases drowsiness was relieved the first day and difficulty of gait by the second day. The dilantin sodium dosage remained unchanged throughout this period.

LAXATIVE DRUGS

In a previous paper we mentioned the omission in a series of cases of the old routine administration of magnesium sulfate by mouth twice weekly in the treat-

TABLE 8.—Comparative Effects of Phenobarbital Alone and Phenobarbital in Combination with Dilantin Sodium During Equivalent Periods

Patient	No. of Weeks in Each Period	Seizure Totals		Daily Dose	
		Phenobarbital Alone	Phenobarbital and Dilantin Sodium	Phenobarbital, Grains	Maximal Dilantin Sodium, Gm.
J. B.	23	15	1	5½	0.2
J. S.	37	145	128	7	0.5
E. C.	28	18	15	3½	0.3
W. G.	40	42	10	6	0.3
L. LaF.	26	24	13	5½	0.3
B. P.	20	13	12	2½	0.4
J. A.	23	7	4	3½	0.3
P. E.	28	17	0	3	0.2
M. O.	24	13	0	2½	0.2
A. P.	23	8	3	3½	0.3
A. S.	18	5	1	4½	0.2
C. M.	23	4	0	5½	0.2
H. S.	26	17	15	2	0.4
N. H.	28	39	19	2½	0.4
M. W.	20	37	31	4	0.4
R. V.	20	43	25	4	0.4
A. S.	28	42	1	5	0.2
M. D.	24	13	2	2	0.3
A. H.	23	81	22	*	0.3
C. C.	26	11	16	5	0.3
M. F.	8	27	11	3	0.3
E. E.	28	36	0	3½	0.2
F. B.	8	5	1	3	0.2
Averages and seizure totals	25	662	330	4	0.3

* On account of a cutaneous idiosyncrasy this patient was receiving bromides instead of phenobarbital.

ment of epilepsy. For this group we also discontinued intestinal lubricants, enemas and all other laxatives. This program has been in effect about a year, and throughout that time these patients have continued to receive adequate phenobarbital. We now confirm our original impressions and wish to point out that the elimination of routine laxatives has been followed by neither gastrointestinal difficulties nor increase of seizures.

COMPARATIVE AND GENERAL EFFECTS OF THE DRUGS USED

In table 9 we compare the percentage reductions of seizures produced by the various drugs.⁴

By comparing total hospital seizure incidence in the past one and one-half years with the number of attacks expected on the basis of record, we estimate that we

TABLE 9.—Comparative Effects of Phenobarbital, Dilantin Sodium and the Two Drugs in Combination on Expected Seizure Incidence

	Reduction from Expected Number of Seizures, %	Number of Patients
Phenobarbital by central control.....	68	141
Dilantin sodium substitution experiment		
Phenobarbital alone	52	18
Dilantin sodium alone.....	6	
Phenobarbital and dilantin sodium..	81	
Supplementary dilantin sodium study		
Phenobarbital alone	47	23
Phenobarbital and dilantin.....	74	

have spared our patients over 8,000 seizures by our various therapeutic programs (a reduction of 71 per cent). This great reduction has been paralleled by an improvement in the whole atmosphere of the wards in which these patients are confined. Accident incidence, previously high, has been lowered to the point of infrequency. The patients have become easier to handle, and in consequence privileges have been increased. Many of them have been able to achieve residence in more desirable wards and also work assignments, previously denied them, because of risk. Status epilepticus, previously common, is now a rarity. Residual seizures are far less severe, and the present trend is so promising that we expect more favorable results in the future.

SUMMARY

Patients with severe epilepsy confined in the Grafton State Hospital have been given intensive and extensive pharmacologic treatment. The increase of phenobarbital dosage up to an average of about 3 grains a day per patient, with due regard for the individual effect, has been attended by great reduction in seizure incidence, amounting to about 68 per cent when compared with treatment by phenobarbital alone given in a routine way and haphazardly.

Dilantin sodium alone has not exerted as favorable an effect in reducing seizure incidence as adequate phenobarbital dosage.

The use of amphetamine sulfate is recommended because of its value in dissipating the untoward effect of idiosyncrasy or excessive doses of phenobarbital. It also has a favorable, although somewhat less marked, effect on the toxic manifestations of dilantin sodium. Furthermore, it permits these drugs, especially phenobarbital, to be continued in unchanged dosage, even though this dosage by itself produces untoward results and when the reduction of dosage would result in increased attacks.

More striking and most important is the synergism existing between phenobarbital and dilantin sodium. The combination is far more efficient than either drug used alone, the reduction in seizure incidence being at least 50 per cent over the most favorable results

4. Figures were determined by the ratio of the weekly seizure incidence under a given drug or drug combination with the number of seizures expected weekly on the basis of individual records in the two years prior to the start of our present program.

obtained without the synergistic use of these drugs. This synergism is in line with the theory that the epileptic attack is a symptom complex and that there are more pharmacologic roads than one to its control.

Up to the present the total trend is remarkably favorable for the further reduction of seizures. On the basis of our experience we feel that in cases of epilepsy which do not yield totally to phenobarbital these two drugs should be used together. In fact, there is no reason why they should not be used together in every new case of epilepsy.

CORONARY OCCLUSION

A REPORT OF UNUSUAL ACTIVITIES AFTER RECOVERY

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There has been in recent years a better appreciation of the relation of structure and function of organs. In ascertaining the prognosis and the expectation of life for patients with heart disease, more emphasis is placed on the functional and less on the anatomic state of the heart and circulation. This change has been notable in the domain of valvular disease. The knowledge of the effects of coronary thrombosis is recent and is still being added to and revised. At first occlusion of a coronary artery was considered immediately and potentially dangerous to life. With more extensive observation there comes a realization that the prognosis must be suited to the degree of damage. The accepted mode of treatment requires restriction of physical activities and freedom from worry as far as possible, for the patient with angina pectoris or the patient who has suffered acute occlusion of a coronary artery is susceptible to other attacks, either fatal or incapacitating. In general it is considered that he should from choice, if not from necessity, forego unnecessary activities.

The exact demarcation between necessary and unnecessary activities is difficult to draw and even more difficult to maintain. To be occupied in a vocation entails exposure to the strains that go with the vocation and the necessary acceptance of activities that may be strenuous. The inescapable trend of such a course is evident in the life of the practicing physician. The vicissitudes of effort, of sleep, of hours of eating, of physical and mental strain are only too inherent in the conduct of a medical practice. To avoid them may mean failure to perform the full duties of, and perhaps therefore the necessity to resign from, the profession.

Probably more than other professional men, physicians suffer from cardiovascular disease, and especially coronary thrombosis. Those who have been afflicted must consider in the period of convalescence the question of retirement or of limited professional activity and its handicap. The issue is difficult to settle. Even as retirement is not desired or possible, so may it not be necessary. Return of physical capacity has often been beyond expectation. The personal records of others are salutary guide-posts. It is my purpose in this report to relate the unusual degree of recovery of a man who has had, so far, over five years of active endeavor after a severe acute attack of occlusion of a coronary artery.

This man has had an intimate experience with vicissitudes of coronary thrombosis. His brother died of

an acute occlusion at the age of 56, one year before the patient suffered his attack. His father died suddenly at 62 of heart disease. His mother-in-law died of a second attack three weeks after her first because, as he expressed it, she had been allowed to be too active. He has had many business acquaintances who have had the same affliction. He has a good understanding, because of his analytic and scientific aptitudes, of the pathologic processes involved in this disease. In the early period of his convalescence he was advised to continue his business career after careful trial of his capacity to meet its demands. With due care, exercised over a period of one year, he resumed and for a second year confined his activities mostly to his vocation. In the last few years, however, the scope of his business affairs has widened considerably. He has elected and been able to meet the increased demands without trouble; also, because of his active temperament, he has indulged in avocations of an unusual nature, to be described.

His original attack occurred Oct. 10, 1933, when he was 43 years of age; it was accompanied by severe substernal pain. During the three weeks before the acute attack there had been seven or eight periods of substernal discomfort, lasting several minutes, usually

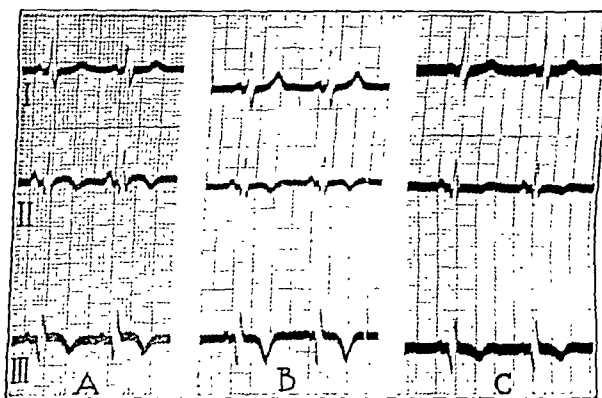


Fig. 1.—The electrocardiograms with standard leads: A, taken Oct. 13, 1933, three days after the attack of coronary occlusion; B, taken December 4, three days before discharge from the hospital; C, taken April 15, 1939. The lead is designated to the left. Precordial leads were also taken; the tracings over the apical portion of the heart showed at first large upright T waves, which became smaller.

at the end of a day's work. His wife had been ill for three years with aplastic anemia, which had worried him considerably. He was indulging in athletics and leading an active, intense business life. His attack occurred during the forenoon. Electrocardiographic examination during the afternoon revealed early changes of coronary thrombosis. He was at home for three days. October 13 he was admitted to the hospital. At that time the temperature was elevated by 2 degrees. It gradually fell to normal by the tenth day. The white blood count was 16,000 cells per cubic millimeter on admission. Within one week it had fallen to the vicinity of 10,000, where it remained thereafter. The electrocardiographic changes were present in the standard second and third leads and in the precordial lead (fig. 1). Frequent records, including the precordial tracings over the front and the back of the chest, were taken. In one electrocardiogram premature contractions of ventricular origin were noted. The infarcted area was in the posterior aspect of the left ventricle. X-ray examination of the heart showed some decrease

in its size during convalescence. On admission the cardiac area was 136 sq. cm.; the transverse diameter was 15.2 cm., that of the lung fields 22.5 cm. (fig. 2). December 4, eight weeks later, the cardiac area was 125 sq. cm.; the diameter of the heart was 12.9 cm., that of the lung fields 26.5 cm. In the earlier film the right dome of the diaphragm was at the level of the eleventh rib posteriorly and in the later film at the tenth rib. Both films were taken with the patient supine in bed.

The regimen of convalescence was rigorously followed. It included seven weeks of complete rest in bed. The patient was discharged from the hospital December 7. He remained at home for one month, foregoing business but undertaking physical activity by gradually increasing walks. He then spent six weeks in Nassau, usually spending twelve hours of the twenty-four in bed and lying about on the beach in the morning; the mean pulse rate was 54 on waking in the morning and 60 at rest during the day. His subsequent activities may be described in his own words in a letter dated April 9, 1937:

Activities since January 1934 have been slowly but steadily increasing. The best measure of activity has been the amount of rest required in each twenty-four hours. The amount of rest in 1934 was about fifteen hours. This level has been reduced to a present average of about nine hours. Business activity has gone up, starting with zero activity in April 1934, steadily increasing until January 1937, when full normal business activity was resumed.

Smoking was dropped completely on hospitalization in 1933 and has never been started again; no coffee at any time; very weak tea irregularly; moderate alcohol irregularly.

Beginning in 1935 a great deal of flying has been done, both as passenger and as pilot, averaging perhaps 100 hours a year. The flying altitude was 3,000 to 5,000 feet, but a considerable amount of flying has been done at altitudes up to 15,000 feet.

The first skiing was in December 1935, with one week at Lake Placid at an elevation of 1,700 feet; in March 1936 there were two weeks at Arosa, Switzerland, at an elevation of 5,000 feet; in 1937 there were three days at St. Moritz at an elevation of 5,000 feet and one week at Zugspitze, Bavaria, at 8,000 feet. The altitude effect in skiing has been quite noticeable as quickened breathing. A further altitude effect was difficulty in getting any sound sleep, experienced at Arosa in 1936, but there was no difficulty whatever at the higher elevation in Zugspitze in 1937.

In addition to skiing, exercise has consisted in occasional swimming and regular dancing, averaging perhaps three to four hours weekly.

Beginning in 1935 green vegetables and fruit were substituted for a substantial part of the usual concentrated carbohydrate and protein foods; green vegetables were usually substituted for meat at one meal a day and fresh fruit for desserts at the main meals. There has been a very large consumption of oysters and clams, averaging perhaps half a dozen per day five days a week.¹

It seems that a marked increase in the feeling of well-being was coincident with the change in diet in 1935. Following each of the skiing holidays in 1936 and 1937 there was also marked increase in the feeling of well-being, gain in weight and reduction in the amount of sleep required. Now from seven and a half to eight and a half hours per night are adequate.

There has been on the average one European trip of about seven weeks' duration every six months since 1934. The trips have been in the main under de luxe conditions but with occasional hardships of travel, such as sleepless nights and limited diet.

The hardest physical exertion has been in skiing, which has been sometimes certainly heavier than was intended and gone nearly to the point of temporary exhaustion.

The death of his wife in June 1934, after a prolonged illness, entailed considerable worry.

His business life requires important decisions in one of the largest corporations in the United States. On his journeys in Europe, negotiations on a large scale have been made with foreign concerns. His business activities became more intense in 1937 and 1938, especially during the critical period in Europe in August and September of 1938 and likewise in 1939. A report dated Jan. 16, 1939, details the extent of these activities:

The regimen established in the beginning of the year 1937 was continued without change through that year and 1938, except that I had no opportunity to do any high altitude skiing during the winter of 1937-1938, owing to pressure of business.

My flying time as pilot has also been almost nil over the last two years for the same reason, but my flying time as

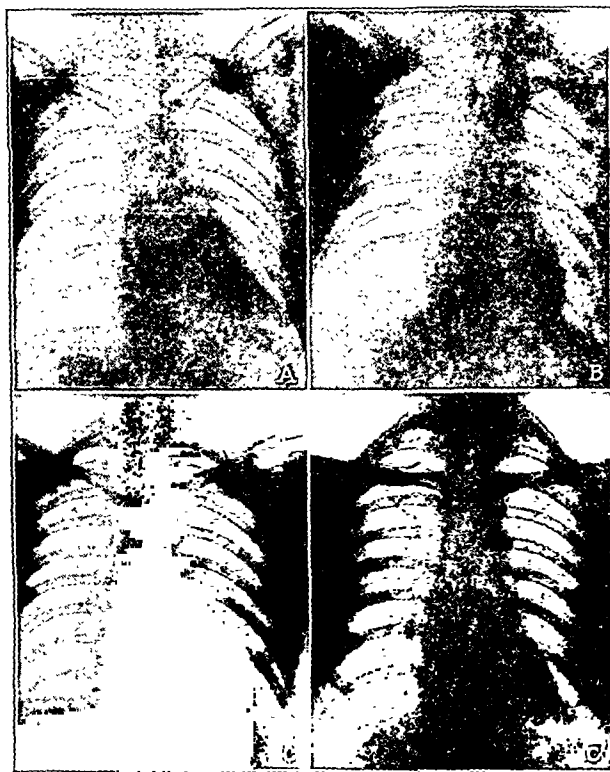


Fig. 2.—Size and shape of the heart, anteroposterior view, from a distance of 6 feet. The patient was lying supine for A, B and C and standing upright for C'. The dates are given in the legend for figure 1; C' was taken on the same day as C.

passenger has been if anything greater. I spent four months in Europe in two trips in the year 1937 and nearly five months in two trips in the year 1938. During these trips my average was perhaps three nights at a stretch in the same bed. Taking out twenty-one days at sea in each year, this would mean about twenty-five days or nights of travel a year in Europe, about half of which was by rail and the other half by air. In addition, each year there has been a fair amount of travel in the United States, including a transcontinental air trip each year. The trip in 1937 necessitated sitting up all night because the sleeper planes were not yet in use; the 1938 trip was in a sleeper plane. American transcontinental altitudes are in the range of from 6,000 to 12,000 feet. European altitudes are lower on the average, being from 3,000 to 8,000 feet, except in the Alps, where I have done very little traveling.

My principal reliance for exercise continues to be skiing and dancing, with supplementary gymnasium work, usually at sea. My weight has increased about 5 pounds during the last two years to the present level of 156 pounds. I usually gain 2 to 4 pounds during a European trip and lose most of it afterward.

1. This diet was selected by the patient.

His remarks following another European trip in March 1939 were:

My skiing holiday was reduced to four days at Kitzbuehl. The elevation of the town hotel was only 800 meters, but the principal skiing slopes are at an elevation of 1,800 meters. I had the usual amount of travel, including flying, but this is all now so much of a routine that I seldom think of it.

Examinations of the patient have been made at semi-annual and annual intervals since his acute illness nearly six years ago. The most recent ones were in November 1938 and April 1939, subsequent to European journeys. The electrocardiogram has presented the residual changes of myocardial infarction (fig. 1). The cardiac shadow has appeared normal in size and shape (fig. 2).

COMMENT

The history of this patient presents unusual features. There was no lack of cooperation during treatment of the acute state. There has been good understanding, on his part, of the nature of coronary thrombosis and its after-care. Flying in airplanes and even piloting a plane alone he has accomplished without trouble. He noted on one occasion while flying a plane across the White Mountains of New England at an altitude of 15,000 feet a slight quickening of respiration and a rise in the pulse rate from 72 to 84. Skiing at a high altitude involves presumably a double burden on the heart, yet he felt improved in strength at the time of his first residence in a high altitude. The history of the effects of coronary thrombosis is such, however, that natural improvement may have occurred at this time. He has been an active man for five and a half years since the original attack, certainly a long period of trial.

There are, no doubt, numerous personal records of unusual degrees of recovery from coronary thrombosis. Of published reports, letters of two English physicians are of interest. One, a consulting practitioner, not only resumed his professional life, with some changes, but indulged in seaside bathing, salmon fishing and skiing and skating in Switzerland.² The other, a surgeon, resumed surgical practice, operating up to three hours at a stretch; fond of sports, he indulged at first in cub hunting and later in riding to hounds.³ In both instances, as in the present case, the period of complete bed rest of from four to six weeks after the acute attack and the gradual resumption of activity in the succeeding five to six months were followed. These are the most important features of treatment.

SUMMARY

The history of a patient who suffered an attack of acute coronary thrombosis is considered noteworthy not because of the disease but because of the activities which the patient has been able to maintain, following very careful treatment for the acute condition. His business career was resumed on the basis of his capacity to meet its demands. The scope of the demands enlarged considerably and entailed a degree of activity beyond that advised and considered possible. In addition, because of his active temperament, flying at various altitudes up to 15,000 feet, dancing, swimming, and skiing each winter at altitudes up to 10,000 feet have all been accomplished apparently without detriment.

This report is published not to stimulate others who have suffered from coronary thrombosis to indulge in

unusual endeavor but to encourage them in expectation of being able to pursue normal activities without too severe restrictions. The range of activities can be gaged only according to the capacity of the individual.

NOTE.—Since this paper was submitted for publication, the patient has made a further unusual journey. He traveled by airplane (Pan-American Airways) to Europe on Aug. 16 and 17, 1939; the trip included nineteen hours of continuous flying from Port Washington, Long Island, to the Azores, and eleven hours of additional flying to Lisbon and Marseilles. The usual height flown on the southern Atlantic route is from 8,000 to 10,000 feet. He returned by airplane over the northern route on October 9 and 10, the journey from Foynes, Ireland, to New York taking about twenty-four hours. Although the flying height was usually 1,000 feet, part of this trip was very uncomfortable because of nausea due to rough weather.

An examination Oct. 20, 1939, six years after the original attack, requires no additional comment on the clinical, electrocardiographic and x-ray appearances.

135 East Sixty-Fourth Street.

Clinical Notes, Suggestions and New Instruments

DELAYED CUTANEOUS REACTION TO INTRA- DERMAL INJECTION OF BRUCELLERGEN IN BRUCELLOSIS

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The cutaneous reaction following the intradermal injection of brucellergen is one of the diagnostic aids in brucellosis. The reaction, when positive, begins within twenty-four to thirty-six hours after injection and persists for more than forty-eight hours. The test is positive if, in addition to an area of erythema around the site of injection, there is also edema or induration which measures from 0.5 to 0.75 cm. or more in diameter. A delayed reaction, that is, one which does not begin until forty-eight hours or more after injection, is rare. It is for this reason that we are reporting a case in which the cutaneous reaction did not appear until the fourth day after the injection of brucellergen.

REPORT OF CASE

A farmer aged 43 entered the University Hospital July 10, 1938, because of headache, pain in the legs and fever. He had always enjoyed good health until December 1937, when he noted bloating of the abdomen after meals. The condition did not progress until three weeks later, when he was seized with severe pain in the lower back which radiated down the distribution of both sciatic nerves and forced him to bed. About the same time chills, fever and exhaustion appeared. These symptoms persisted with exacerbations and remissions until his admission to the hospital.

He consulted his physician about one week before admission, at which time a tentative diagnosis of brucellosis was made. Sulfanilamide was prescribed, and a severe persistent daily headache developed the following day. This symptom caused him to discontinue the drug and to come to the University Hospital. The history did not reveal the source of the *Brucella* infection.

The significant objective manifestations in this well developed and nourished man, who appeared acutely ill, were tenderness over both sciatic foramina, a temperature of 100.2 F., a pulse rate of 100 beats per minute, a leukocyte count of 13,200, a normal spinal fluid, a negative blood Wassermann reaction, repeatedly negative blood cultures and agglutination reactions for *Brucella*, a positive opsonocytaphagic index, and a trace of sulfanilamide in the blood.

One tenth cc. of brucellergen was injected intradermally into the left forearm on July 10. There was no reaction at the site of injection until the late afternoon of July 14. The

From the Department of Internal Medicine, State University of Iowa College of Medicine.

2. Coronary Thrombosis and After: A Personal Story, correspondence, *Lancet* 2: 331 (Aug. 11) 1934.
3. Coronary Thrombosis: The First Year After, correspondence, *Lancet* 1: 1472 (June 22) 1935.

following morning the area of erythema measured 4 cm. in diameter, and the central area of edema 1 by 1.5 cm. A second cutaneous test, made on the right forearm on the evening of July 14, resulted the next morning in an area of erythema 6 by 6 cm. in diameter with a central area of edema measuring 2 by 2.5 cm.

COMMENT

Huddleston¹ states that a delayed skin reaction in brucellosis is extremely rare. He has observed only two such instances. In both cases the specificity of the reaction was doubtful. Foshay,² on the other hand, thinks that the delayed reaction is not as rare as the literature indicates. He has seen such reactions in four or five cases of undoubted brucellosis. In his experience the reaction may be delayed as late as the seventh day, and such a delayed reaction is more likely to occur in the chronic than in the acute phase of the disease. That this type of reaction is rare in this clinic is illustrated by the fact that the diagnosis of brucellosis has been made in 160 cases during the past nine years, during which time only two such reactions have been observed. The other occurred in a parent of a patient in the Department of Pediatrics and was called to our attention by Dr. R. L. Jackson.³ We have been unable to find any report in the literature of a delayed skin reaction, as such, but Dr. Foshay states that he has seen it mentioned in the general literature on brucellosis.

The cause for the delayed reaction is not clear. The administration of sulfanilamide to our patient just prior to the test raised the question whether or not this drug prolonged the time of appearance of the reaction. That not all delayed reactions are due to this drug is shown by the experience of Huddleston, Foshay and Jackson, whose patients did not receive sulfanilamide. Furthermore, our own experience makes it doubtful whether sulfanilamide will produce a delay in the cutaneous reaction in brucellosis. We have administered the drug for periods of from two to five days to two patients who previously had shown positive cutaneous tests without alteration of the time of appearance of the reaction. A third patient receiving the drug at the time of admission did not show a delayed reaction. The last patient had not had a previous cutaneous test with brucellergen.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

PAUL NICHOLAS LEECH, Secretary.

THE PRESENT STATUS OF THERAPY WITH CHORIONIC GONADOTROPIN

The gonadotropic substance from the urine of pregnancy has been available for clinical use for nine years. Although it was enthusiastically received by physicians and placed in extensive therapeutic use, there has always remained a certain amount of skepticism as to its value. The following report contains a summary of the experiences with this substance in the clinic up to the present time with an evaluation of the results reported.

When the gonadotropic activity of pregnancy urine was first demonstrated by Zondek, it was considered that the responsible substance was secreted by the anterior pituitary. In rodents, pregnancy urine, or certain extracts thereof, induced follicular growth and corpus luteum formation. At the time, the concept was advanced that this gonadotropin consisted of two hormones—prolan A, the follicle stimulating hormone, and prolan B, the luteinizing hormone—on the basis of its effect in the rat, mouse and rabbit. Further experimentation has, however, revealed that this substance is a single entity and not composed of two factors, that it arises from the placenta rather than from the pituitary and that it differs fundamentally from the gonadotropins of the anterior lobe.

One of the most significant differences in its physiologic reactions from anterior lobe preparations is its inability to stimulate

to any appreciable extent the ovary of the monkey or the human being. Injection of chorionic gonadotropin into primates will not induce follicular growth or corpus luteum formation. On the contrary, reliable investigators have observed definite degenerative changes in the ovaries of women and monkeys treated with this substance. In addition, no clearcut endometrial responses have been observed in primates treated in this manner, which indicates conclusively the inability of this substance to stimulate the growth of normal ovarian structures.

The physiologic action of chorionic gonadotropin is not limited to the female, but it exerts a definite effect on the male reproductive organs. It is generally agreed that this substance acts on the interstitial cells of the testes, causing them to elaborate the androgenic hormone of the testis, which in turn induces growth of the accessory sex organs. This substance is effective in male monkeys and human beings. Among the reactions induced in the monkey is the descent of the testes in the prepubertal animal. In some animals there may be some increase in size of the seminiferous tubules, but there is little if any effect on the germinal epithelium. Spermatogenesis is, however, maintained by chorionic gonadotropin in recently hypophysectomized rats, but it is not restored after atrophy or induced in normal immature rats.

The therapeutic application of chorionic gonadotropin has covered a wide range of conditions. Many of the trials have been on an unsound or improperly conceived basis. Its use in the treatment of ovarian disturbance, for example, has no scientific rationale at the present time, although when first introduced for the treatment of these dysfunctions the physiologic basis for therapy appeared excellent.

First, Novak and Hurd¹ reported gratifying results in the treatment of functional menorrhagia with chorionic gonadotropin. They based their treatment on the concept that excessive menstrual flow of functional origin resulted from the lack of an active corpus luteum in the ovary. Thus the ovarian estrogen was unopposed by progesterone, the hormone of the corpus luteum, with consequent uterine hemorrhage. Chorionic gonadotropin was therefore administered in an attempt to induce the formation of a corpus luteum in the patient. The reported successful results were ascribed to this response. It developed shortly afterward that this substance has little or no ability to luteinize the human ovary. Novak² has since admitted the lack of a suitable explanation for the therapeutic responses which he obtained in such cases, although he still maintains that good results are obtained. It might be mentioned at this point that functional uterine bleeding is frequently found in the presence of a secretory endometrium, which indicates an active corpus luteum in these cases. The rationale of unopposed estrogen originally advanced for the use of chorionic gonadotropin in menorrhagia is therefore without basis in many instances.

By far the most common type of ovarian dysfunction treated with this substance is uterine bleeding. As mentioned previously, a satisfactory rationale for the treatment in this condition is lacking. There have been published, however, a great many reports dealing with such therapy. Some of these reports favor enthusiastically the use of chorionic gonadotropin in bleeding cases while others are equally pessimistic. It is difficult to discount the results of many investigators, but at the same time the failure to obtain such results by others cannot be disregarded. A recent review by Jeffcoate³ analyzes thoroughly the literature up to 1937. Jeffcoate combined a summary of the published data with the results of a questionnaire which he submitted to a number of clinicians in Europe. The following quotations indicate much of Jeffcoate's evaluation of this therapy:

"Results Collected from Literature.—The collection of published results is associated with many difficulties. The number of communications dealing with organotherapy is immense, but the number of recorded cases is comparatively small. Many authors mention that they have treated several hundreds of patients successfully, but they make no attempt to give details, and others base their conclusions on isolated cases. Extravagant claims, unaccompanied by clinical notes, are common and create the impression that they are handed on as unverified statements from one

1. Novak, Emil, and Hurd, G. B.: Use of an Anterior Pituitary Luteinizing Substance in the Treatment of Functional Uterine Bleeding, *M. J. Obst. & Gynec.* 22: 501 (Oct.) 1931.

2. Novak, Emil: Cause and Treatment of Functional Uterine Bleeding, *Texas State M. J.* 34: 263 (Aug.) 1938.

3. Jeffcoate, T. N. H.: Treatment of Functional Uterine Hemorrhage by Means of Gonadotropic and Ovarian Hormones, *J. Obst. & Gynec. Brit. Emp.* 44: 31 (Feb.) 1937.

1. Huddleston, I. Forrest: Personal communication to the authors.

2. Foshay, Lee: Personal communication to the authors.

3. Jackson, R. L.: Personal communication to the authors.

writer to another. After a close search and excluding articles in which not more than two cases are described, records (and some of these are very incomplete) of only 594 cases have been traced. Comparison of individual statistics is not always easy, since different commercial preparations are used by different observers; some series of cases are grouped on a pathological, others on a clinical, basis, while many are presented without any attempt at classification. Moreover, the after-histories of the cases described are frequently omitted.

"Control of Bleeding.—Consideration of table I reveals extraordinary variations in results. The percentage of cures varies from 100 to 28 and is 69 for the whole series. Some writers are much impressed with this method of treatment while others consider it almost useless. There is a suggestion in recent reports that others have noticed this lack of uniformity in results.

"In this connection, inquiry into the details of recorded cases shows that individual criteria of success vary, and many patients described by a particular writer as being cured would be viewed by another observer as showing no response to treatment. Moreover, the estimation of results is always clouded by the fact that functional uterine hemorrhage is a condition which is likely to cease spontaneously, and it is impossible to control results except by amassing large numbers of cases.

"Other factors contributing to the variation in results are the differences in the individual techniques and dosage and the inconstant potency of the preparations used, as emphasized by Novak and Hurd. Nevertheless, it is likely that the total figures of reported results, as presented here, give a more accurate conception of the value of the treatment than do the claims of individual writers each basing his conclusions on small numbers of cases."

"The opinions expressed in reply to the questionnaire (tables IX and X) are illuminating and provide the final and conclusive proof that this form of treatment does not satisfy the claims which hitherto have been made for it. Of twenty-seven authorities using gonadotropic hormones, only five report consistently good results (in specially chosen patients), fourteen note poor or fair response, and two of these, Maguire, Plasse, and one, Stander, believe that all the so-called cures are merely spontaneous and in no way connected with the treatment. From these figures, the only possible conclusion is that clinicians in general are coming to regard even this type of organotherapy as being unreliable, and although it may produce some brilliant results, it is by no means rare to see patients who show no response to it."

The response of such cases to chorionic gonadotropin is often temporary. According to Jeffcoate:

"Although it is frequently stated that the advantage which the use of gonadotropic hormones has over other methods of treatment such as curettage or even the administration of corpus luteum is that the ordered ovarian cycle is permanently corrected, the statistics presented in the accompanying tables provide no confirmation of this. On the contrary, the high proportion of cases which relapse is a clear indication that the success of treatment is purely temporary. Novak, who in 1931 asserted that the effect applies only to the particular attack of hemorrhage for which organotherapy is instituted. Neumann and Meigs also confirm this opinion. The replies to the questionnaire provide further confirmation of this view; there are no observers who say that gonadotropic hormone therapy is consistently permanent in its effects, two say it is probably permanent, and a third that it produces permanent cures in pubescent cases only; the remaining twenty-one replies (88 per cent) indicate that it is purely temporary in action or very variable in its remote effects. It would seem that the subsequent menstrual history of most patients resembles that of those who receive no hormonal treatment for this disorder. All these cases of functional uterine hemorrhage have a distinct possibility of a spontaneous recovery, but there is, in all, a relapse in menapausal patients explains why this form of treatment is apparently of less value in their cases than it is in the control of anovular hemorrhage in early life."

Few clinical reports have appeared since 1937. Novak in 1938 wrote that "in a considerable proportion of cases the bleeding is checked or improved though in many others it is not." Mazer,⁴ who at one time wrote optimistically that chorionic gonadotropin was "almost a specific in the treatment of functional uterine bleeding of puberty and maturity," has altered his views somewhat. He believes now that there is a "cure" in 60 per cent of dysfunctional bleeding in the child bearing age, but it is far less effective in pubertal or menopausal bleeding. Hamblen⁵ has recently reviewed the therapeutics of gonadotropic substances in ovarian disorders. His conclusions reflect the uncertainty of this therapy:

"Consideration of the clinical data available indicates that there exists little definite proof that therapeutic efficiency has been established for the gonadotropes in most supposed endocrinopathic gynecology."

There seems little doubt that the early enthusiasm is shared by fewer investigators at the present time. The skepticism of many as to its value in bleeding cases is nurtured by the lack of a sound physiologic basis for such therapy. In the first place, the causes of these conditions have not been demonstrated and, in the second, the ability of chorionic gonadotropin to induce appropriate ovarian changes seems most doubtful.

The possibility of ovarian damage by this therapy has been discussed by various investigators. It is commonly noted that patients develop periods of six to nine months amenorrhea after the therapy, which is interpreted frequently as a temporary arrest of ovarian function. Likewise, the occurrence of an increase in menstrual flow immediately after the first or second injection has been suggested as being due to a sudden drop in estrin threshold due to inhibition of ovarian activity. The consensus is, however, that little permanent damage is inflicted by chorionic gonadotropin.

There are numerous other ovarian conditions in which chorionic gonadotropin has been tried, such as amenorrhea, dysmenorrhea and sterility. Most of this work is fragmentary or inadequately confirmed. The lack of data justifies the conclusion that the claims for the use of chorionic gonadotropin in these ovarian disturbances are unwarranted.

CRYPTORCHIDISM

By far the greatest use for chorionic gonadotropin therapy has been in the treatment of disturbances of the male sex organs. A large number of investigators have reported successful treatment with it in cryptorchidism and in hypogonadal states. Data have been presented which ordinarily would firmly establish this treatment in cryptorchidism as reliable and consistently beneficial. In the past year or two, however, a certain amount of doubt has developed as to the value of this therapy and the entire problem has been reopened to considerable questioning. Engle showed that chorionic gonadotropin was capable of inducing descent of the testes in immature monkeys. Shapiro⁶ was first to demonstrate that similar results could be obtained in cryptorchid boys. This work was soon confirmed by many others, and it became more or less accepted that this therapy was indicated in all cases of cryptorchidism unless there was some form of anatomic lesion preventing the descent of the testes into the scrotum.

In spite of the general accord with which this therapy was held, a discrepant note was later interjected by several investigators. Thompson⁷ and others have repeatedly failed to obtain the high percentage of successful results reported by other workers. They were able to induce descent in only 20 per cent of fifty undescended testes compared to about 60 per cent of 860 undescended testes reported in the literature. They attribute this difference in results to the fact that there was excluded from their treatment all testes of the migratory type—those which can be readily manipulated into the scrotum. This type of testis was classified as pseudocryptorchidism, which has been described by Hamilton. Gentle handling, warmth and relaxation will often relieve the cremasteric spasm and bring the testes into the scrotum. It seems quite likely that many such cases have been included in series which were treated with chorionic gonadotropin. Those cases in which descent was induced within a few hours or days are undoubtedly pseudocryptorchids.

The conviction is growing that testes which descend after hormonal therapy are those which would descend without treatment at puberty. Apparently the mechanism of descent is the elaboration of testicular hormone spontaneously at puberty or induced by gonadotropic hormone administration before puberty. Johnson⁸ has recently called attention to the fact that of 1,000 boys examined in a routine manner seventeen were cryptorchid but that there were only two adults in 1,000 with this condition. He believed it conclusive, on these grounds, that fifteen of the original seventeen in 1,000 had had spontaneous descent. Thompson and his associates likewise have questioned the value of chorionic gonadotropin therapy for descent of the testes if it does no more than produce a descent at an earlier age than at which there would be a natural cure. According to these authors:

"The crux of the problem is whether a testis made to descend at an early age with treatment is more likely to be normal than one which descends later without treatment. The consensus appears to be that in

6. Shapiro, Bernhard: Kann man mit Hypophysenvorderlappen den unterentwickelten männlichen Genitalapparat beim Menschen zum Wachstum anregen? Deutsche Med. Wchnschr. 56:1605 (Sept. 19) 1930.
7. Thompson, W. O.; Heckel, N. J.; Thompson, Phebe K., and Dickie, L. F. N.: Further Observations on the Treatment of Hypogonadal Undescended Testes with Special Reference to the Production of Mature Puberty, Endocrinology 22:59 (Jan.) 1938. Thompson, W. O., and Heckel, N. J.: Undescended Testes, J. A. M. A. 112:397 (Feb. 4) 1939.
8. Johnson, W. W.: Cryptorchidism, J. A. M. A. 113:25 (July 1) 1939.

4. Mazer, Charles: Personal communication.

5. Hamblen, E. C.: Clinical Evaluation of Ovarian Responses to Gonadotropic Therapy, Endocrinology 24:848 (June) 1939.

true cryptorchidism the testis should be brought into the scrotum at an early age, although there is some difference of opinion on this point. Treatment with this material, by distinguishing between those cases in which descent is prevented by anatomic factors and those in which it is not, makes it possible to tell early what patients will require surgical intervention. However, it should be pointed out that little is known about the effect of premature stimulation with this material on the function of the testis after puberty."

In their opinion, the puberty hormonal treatment of this condition should not be accepted without question:

"In the light of these observations it is important to maintain an open mind on the treatment of undescended testes with the anterior pituitary-like principle. Many reports appear to be overenthusiastic. If the importance of bringing the testis into the scrotum at the earliest possible age has not been overestimated, perhaps the wisest course is to administer this material cautiously and carry out operative procedures if descent fails to occur."

An analysis of the results and more recent trends in such therapy reveals that (1) cures are not as frequent as reported in the early literature, which undoubtedly included many cases of pseudocryptorchidism, (2) most cases which respond to such therapy would descend spontaneously at puberty, (3) those cases which do not respond to this therapy require surgery, and surgery at an early age is desirable, and (4) such therapy reveals usually whether or not the testes will descend spontaneously without waiting until puberty arrives. It also claimed that endocrine therapy aids in the surgical treatment of undescended testes, either preoperatively or postoperatively. It may therefore be concluded that, although the early optimism is unwarranted, gonadotropic therapy is of value in cryptorchidism if the limitations of such therapy are understood by the physician.

The untoward or toxic effects have been chiefly confined to an occasional inflammatory reaction and pain at the site of injection or an occasional mild febrile reaction. Precocious puberty with enlargement of the genitals is a more serious type of undesirable reaction in boys under treatment. This occurs usually after long continued administration at a relatively high dosage. Besides the dangers of psychic disturbances, there exists the possibility of affecting the growth of long bones by this premature aging under the influence of the male sex hormone elaborated by the testes. In order to avoid the risk of excessive testicular stimulation, it is advisable to limit the administration of chorionic gonadotropin to from six to eight weeks. If there are no signs of descent by this time, there is slight chance of its occurring.

In addition to this danger, it has been shown that long continued administration may lead to inflammatory changes and adhesion about the retained testes which may interfere with surgical procedures.⁹ These observations have not been confirmed as yet.

HYPOGONADISM

The condition which is most often associated with hypogonadal activity is the so-called Frölich's syndrome. The diagnosis of disturbance is quite frequently made, usually on the basis of fat distribution and small genitalia. Most of these patients, however, respond to diet alone and after puberty develop in a normal manner sexually. The diagnosis of hypogonadism or Frölich's syndrome in children should be made with reserve and the endocrine treatment should accordingly be avoided. After the normal age of puberty, however, hypogonadism can be more readily diagnosed and treatment may then be instituted.

The few reports in the literature indicate that adult patients who failed to mature sexually may respond to chorionic gonadotropin. The genitals enlarge and masculine characteristics develop. This therapy is temporary, however, and the changes regress as soon as the therapy is stopped. The data published on the results with this therapy are as yet inadequate as a basis on which final conclusions can be drawn.

SPERMATOGENESIS

Several investigators have reported the use of chorionic gonadotropin in sterility. Their studies are rather incomplete. Brosius and Schaffer¹⁰ have reported the induction of spermatogenesis with such therapy in a case of azoospermia. Heckel¹¹ has treated eight sterile males with this substance, after which

the wives of two became pregnant. Rubinstein¹² claims that the sperm counts increased following such therapy. His results are statistically unconvincing. On the other hand, McCahey¹³ was unable to demonstrate any increase in the sperm count after injection of chorionic gonadotropin. Many other urologists have been disappointed in its use in sterility. The physiologic response of this substance in experimental animals would not lead one to anticipate much of an effect on spermatogenesis, since it is well known that this substance influences chiefly the interstitial cells and has little if any effect on the germinative epithelium. It is therefore apparent that deficient sperm formation is a doubtful indication for such therapy on both clinical and experimental evidence.

OTHER REPORTED USES

Many conditions have been suggested for the use of chorionic gonadotropin. Acne, the eternal target of every new endocrine preparation, has received considerable attention. Except for isolated enthusiastic reports, the results have not been found encouraging.¹⁴ Other conditions which have been mentioned for this therapy include enuresis, migraine and peripheral vascular disease, but adequate evidence in support of such therapeutic claims is still lacking.

CONCLUSIONS

Among the conditions for which chorionic gonadotropin is recommended are functional uterine bleeding, cryptorchidism, hypogonitism, amenorrhea, oligomenorrhea and enuresis. In accordance with the more recent developments in this therapy the Council is unable to endorse many of these recommendations. The Council believes that such therapy is of definite value in functional cryptorchidism within the limitations discussed previously in this report. Although a considerable amount of data has been published on the treatment of uterine bleeding, the Council considers this therapy still unproved. Such treatment of other ovarian disturbances appears practically of little value. Until further evidence will have been made available, the Council approves of this treatment for cryptorchidism but considers such therapy of functional uterine bleeding as still being in the experimental stage. Likewise the treatment of male hypogonadism is also considered experimental. The Council approves of no other indications for such therapy at the present time.

THE FOLLOWING REPORT ON NOMENCLATURE WAS ADOPTED BY THE COUNCIL BUT WAS WITHHELD FROM PUBLICATION BECAUSE THE COUNCIL WAS CONSIDERING ACCEPTANCE OF THE DRUG, WHEN IT COULD BE PUBLISHED SIMULTANEOUSLY WITH THE DESCRIPTION OF THE LATTER. SINCE IT DOES NOT SEEM PROBABLE THAT THE DRUG WILL BE ACCEPTED IN THE NEAR FUTURE, IT WAS THOUGHT ADVISABLE TO RELEASE THE REPORT.

PAUL NICHOLAS LEECH, Secretary.

NEOPRONTOSIL (FORMERLY PRONTOSIL)—AZOSULFAMIDE

The term "Prontosil" has been used both abroad and in this country to denote a number of substances. The Council informed the Winthrop Chemical Company that it could not recognize the term "Prontosil." The firm stated that it would be willing to adopt the term "Neoprontosil" for the substance formerly known as 4-sulfonamide benzene-2-azo-1-hydroxy-7-acetylamino naphthalene-3:6-disodium sulfonate. The firm inquired whether the Council would be willing to accept the name "Azosulfanil" as the nonproprietary descriptive name for this product, but it was the opinion of the Council that this term might be misleading, since it carried apparently incorrect implication as to the structure of the compound. The Council voted that Neoprontosil be recognized as the Winthrop proprietary name for the product 4-sulfonamide benzene-2-azo-1-hydroxy-7-acetylamino naphthalene-3:6-disodium sulfonate, and that Azosulfamide be recognized as the descriptive nonproprietary name for this substance.

The Council points out, however, that the product "Neoprontosil" does not stand accepted for inclusion in New and Non-official Remedies because the firm, to date, has not made the product acceptable.

9. Mimpriss, T. W.: The Treatment of Retention of the Testis, *Lancet* 1: 533 (March 5) 1938.

10. Brosius, W. L., and Schaffer, R. L.: Spermatogenesis Following Therapy with Good Stimulating Extract from the Urine of Pregnancy, *J. A. M. A.* 101: 1227 (Oct. 14) 1933.

11. Heckel, N. J.: Gonadotropic and Gonadotropin-like Factors (Antuitrin and Antuitrin-S) in Male Sterility, *Endocrinology* 22: 111 (Jan.) 1938.

12. Rubinstein, H. S.: Effect of Anterior Pituitary-like Hormone on Spermatogenesis, *Endocrinology* 23: 75 (July) 1938.

13. McCahey, J. F.: Gonadotropic Hormone Therapy in Cryptorchidism and Disturbances of Spermatogenesis, *Pennsylvania M. J.* 41: 358 (Feb.) 1938.

14. Ereaux, L. D.: Facts, Fads and Fancies in the Treatment of Acne, *Canad. M. A. J.* 39: 257 (Sept.) 1938.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 10, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

THE NEW WAGNER HOSPITAL BILL

Elsewhere in this issue appear a statement sent by the President to Congress relative to his plans for the building of hospitals and also a transcript of a bill, S. 3230, introduced by Mr. Wagner in the Senate of the United States on February 1. Here is a new pattern not observable in other medical or hospital legislation introduced in recent years. This measure provides for assisting state, county, health and hospital districts or other political subdivisions; thus it recognizes the local character of most problems in medical service. The total sum involved is relatively small, indicating the experimental nature of the proposal. The third section indicates that communities applying for such hospitals must establish the existence of need. Moreover, these hospitals are to be available to all groups of the population.

Especially significant is section 4, which establishes a national advisory council to consist of six members, who

shall be selected from leading medical or scientific authorities outstanding in matters pertaining to hospitals and other public health services. These six members are to be appointed by the Surgeon General with the approval of the Federal Security Administrator. These offices are largely honorary, since the compensation is \$25 a day and expenses. Their services are wholly advisory, but obviously their opinions are likely to have considerable weight with the officials primarily responsible for carrying out the work. Indeed, the advisory council is charged with considering and recommending to the Surgeon General all applications for funds for building hospitals. It is to formulate standards, review reports and make inspections relative to professional services and the standard of maintenance of the hospital. In this connection the Surgeon General is also authorized, after consultation with the council, to study needs for hospitalization and problems of hospital operation, to approve projects in the hospital field, to provide for training and instruction of personnel, to make inspection and reports on professional services, and to safeguard the quality of service.

The hospitals are to be leased to the communities in which they are established, the only consideration for the lease being the maintenance and operation of the hospital in accordance with the provisions of the act. It is indicated that the lease may be terminated by the Surgeon General on six months' notice if the hospital fails to comply with the provisions of the act. Apparently nothing is said as to what will be done with a hospital in case the lease is terminated.

In section 10, hospitals are authorized to include physical facilities necessary not only for the prevention and diagnosis or treatment of disease but also for protection of the public health. Thus it becomes possible to establish health protecting agencies within the structure of the hospital. The divergence of opinions on the desirability of this integration of public preventive medical services into private or community hospitals demands careful consideration before the final wording is determined.

Coincidentally, Senator Mead, of New York, introduced into the Senate his bill, S. 3246, to authorize loans for hospitals, water, sewers, stream pollution control, and related projects and facilities. This bill proposes to authorize a federal appropriation of \$300,000,000 for the projects mentioned. It defines a hospital as any institution or facilities for treating illness or disease, including any health, diagnostic or treatment center, station, institution or clinic. This bill also states that not to exceed \$100,000,000 be devoted to the hospital projects. This bill has been referred to the Senate Committee on Banking and Currency, of which Senator Wagner is chairman.

The Wagner bill was also introduced into the House of Representatives on January 31 by Mr. Lea and referred in that body to the Committee on Interstate and Foreign Commerce. It would seem to any casual

observer that only one of these bills is needed to accomplish the President's purpose, and that therefore the Wagner bill is the one likely to have much consideration, rather than the Mead bill.

Obviously this bill, if enacted, will place a tremendous responsibility on the Surgeon General of the United States Public Health Service and the Federal Security Administrator. The location and conduct of these new medical institutions is a matter which will concern greatly not only the public but particularly the medical profession and all who work in the field of the hospital. Perhaps, therefore, it might be better to assign a little larger share of responsibility and control to the Advisory Council. Moreover, the language of the act is somewhat confusing in that certain phrases fail to specify clearly the fact that these clauses apply only to the hospitals to be built under the act and do not concern inspection, training of personnel, or control of hospitals and medical services generally.

THE COUNCIL ON PHARMACY AND CHEMISTRY COMPLETES THIRTY- FIVE YEARS OF SERVICE

Thirty-five years has passed since the Council on Pharmacy and Chemistry met at Pittsburgh to organize. Since that time its work as a standing committee of the Board of Trustees of the American Medical Association has been continuous. In 1905 the exploitation and advertising of drugs to physicians were "misleading," "mendacious," "execrable." Shortly after formation of the Council the Food and Drug Act of 1906 was passed by Congress. Probably at that time some felt that the passing of that law made the work of the Council unnecessary.

First the Council exposed the most egregious of the deceptions practiced on the medical profession. Then came the more serious task of passing on proprietary drugs detailed to the medical profession. Products which complied with the rules were listed in the column of *THE JOURNAL* called New and Nonofficial Remedies. The first issues of New and Nonofficial Remedies were printed as supplements to *THE JOURNAL* but soon it became evident that the material would be too voluminous for such use. In 1907 appeared a volume entitled Reprints of New and Nonofficial Remedies, including reprints from *THE JOURNAL* of articles tentatively accepted by the Council on Pharmacy and Chemistry. It contained 112 pages and included 230 products. The first issue of New and Nonofficial Remedies as a book, which has been the prototype of all subsequent annual volumes of this book, was that of 1909, consisting of 147 pages of descriptions of products. The latest volume of New and Nonofficial Remedies (1939) contained 531 pages, exclusive of the various indexes, and is printed in much smaller type than that of 1909.

From the time of its organization the names of the members of the Council and their connections have been made known; members, with the exception of the

executive secretary, serve without remuneration. The Council publishes its conclusions, whether they were for or against the acceptance of a drug. It issues reports to the medical profession on matters of *materia medica*. Products are admitted according to a set of rules published for the information of physicians and manufacturers. Remuneration in any form is never accepted for the consideration of submitted preparations. Of the original membership¹ in the Council two have served continuously during this period—Professor Emeritus Robert A. Hatcher, of Cornell University Medical College, and Dean Torald Sollmann, of Western Reserve University School of Medicine. The Council still publishes its reports almost weekly in the columns of *THE JOURNAL*, both on the rejection and on the acceptance of various drug preparations. In addition it publishes statements on the status of new drugs. In 1939 reports on the status of drugs included those on sulfapyridine, chorionic gonadotropin, vitamin K, testosterone propionate, the promiscuous use of barbitol compounds, sobisminol mass and sobisminol solution, cyclopropane, vitamins, local anesthetics, dilantin sodium, picrotoxin and stilbestrol.

The rules now governing the acceptance or rejection of remedies are practically the same as those adopted in 1905. The interpretation of the rules, however, has been amplified and clarified to meet new conditions. An additional rule was adopted about fifteen years ago to the effect that concerns whose policies were contrary to scientific medicine and inimical to the best interests of the public and the medical profession would not be recognized by the Council. Now, in 1940, the situation as far as the consideration of drugs is concerned is vastly improved, owing largely to the efforts of the Council, with the militant aid of *THE JOURNAL*. Advertising claims employed by manufacturers of pharmaceuticals for products accepted by the Council have, in the main, attained standards of accurateness and truthfulness not found in any other field of marketing or in the entire medical world outside the United States. In fact, physicians look askance at journals which accept advertising of non-Council accepted products. More and more physicians ask detail men whether or not their proprietary products have been accepted by the Council and if not, why not. Now a new Food, Drug and Cosmetic Act has just become effective, and again some suggest that there may be little need for the Council on Pharmacy and Chemistry. The new Food, Drug and Cosmetic Act has been a decided advance, but mainly in the field of drugs sold for self medication or, as currently termed, for "over the counter" sales. The licensing bill for new drugs is intended to determine the harmfulness of the drug. Congress did not give the Food and Drug Administration power to determine

1. The original members of the Council were Arthur R. Cushny,* C. Lewis Diehl,* C. S. N. Hallberg,* Robert A. Hatcher, L. F. Kebler, J. H. Long,* F. G. Novy, W. A. Puckner,* Samuel P. Sadtler,* J. O. Schlotterbeck,* George H. Simmons,* Torald Sollmann, Julius Stieglitz,* M. I. Wilbert* and H. W. Wiley.* Those whose names are followed by an asterisk are deceased.

whether or not a drug is a worth while addition to *materia medica*. Congress, in enacting the Wheeler-Lea Act and the Food, Drug and Cosmetic Act, has also realized the necessity of expert medical opinion. More and more, no doubt, the opinions of the Council will increase in importance. Those firms which have been following the leadership of the Council have already found that it is much easier to comply with the new Food, Drug and Cosmetic Act and the Wheeler-Lea Act in the case of their accepted medicaments than have some firms which have tried to ignore the Council by extolling nonaccepted preparations.

The Board of Trustees has increased frequently the personnel of the headquarters staff,² which carries out the executive work. The unselfish service of the Council members and the accomplishments of the Council merit the unfailing continued support of the medical profession.

HEALTH AT THE NEW YORK FAIR IN 1940

The announcement, just released, that the Medicine and Public Health Building at the New York World's Fair will reopen for the 1940 season on May 11 under the direction of the American Museum of Health is gratifying. Undertaken last year as an idealistic experiment, the medical and public health exhibits at the New York World's Fair enter the new season with a background of proved success. More than 7,500,000 visitors were clocked in a daily check on attendance. This breaks the record in the field previously held by the International Hygiene Exposition in Dresden in 1911 with 5,500,000. Every third World's Fair visitor came to see these exhibits, demonstrating the intense interest of people in their health even in competition with extravagant presentations of industrial enterprises.

In assuming direction of the medical and public health exhibits the American Museum of Health will maintain the same policy that guided the planning of the exhibits last season. With the backing and cooperation of the medical profession, each exhibit will present with scientific accuracy the important fundamentals and noteworthy developments in medical science. There will be no exploitation of commercial products or organizations. The ethical pharmaceutical houses and non-commercial organizations which participated in the 1939 exhibit have expressed their willingness to continue their exhibits under this policy, which brought them so much public good will.

More than one and a quarter million dollars was expended in the presentation last year. Although it was designed primarily for the general public, professional visitors last year found many points of interest. Among

them were such exhibits as those on allergy, the pneumonia exhibit demonstrating serum therapy and sulapyridine, the scientific exhibit of the Rockefeller Institute on the newest discoveries in the virus field, the famous Carrel-Lindbergh method of maintaining life in entire organs when outside the body, and the introduction to such new diseases as equine encephalomyelitis. Of interest to the general public, professional visitors and especially medical students was the effective exhibit on medical education, sponsored by the American Medical Association. One of the best attended exhibits in the Hall of Medical Science, this exhibit presented a concise yet comprehensive picture of the varied elements in a medical education and the high standards in medical training prevalent in this country. The Association was responsible also for another popular feature: the decorative and educational murals on the main aisle in this hall. These murals, depicting the history of the advancement of medical science, were financed by the Association and executed by artists of the Federal Art Project. Members of the American Medical Association should plan definitely to visit the Medicine and Public Health Building during the annual session of the Association to be held this year in New York.

Current Comment

ALLOTMENT OF FEDERAL FUNDS FOR PUBLIC HEALTH SERVICES

The Surgeon General of the United States Public Health Service, with the approval of the Federal Security Administrator, has recently revised the regulations under which federal funds authorized by the Social Security Act for establishing and maintaining adequate public health services are to be distributed for the fiscal year 1940.¹ Allotments amounting to 29.1 per cent of the available appropriations will be made to the several states in the ratio which the population of each state bears to the population of the United States as shown by the Census Bureau 1937 midyear population estimates. Allotments amounting to 41.8 per cent of available appropriations will be made to the several states on the basis of (1) the ratio which the mean annual number of deaths in each state from pneumonia, cancer and other infectious and parasitic diseases, except influenza and syphilis, bears to the total mortality from these causes in the United States as shown by the Bureau of Census Mortality Statistics for the four years 1931-1934; (2) prevalence of malaria, hookworm disease, trachoma, typhus fever and similar geographically limited diseases, special industrial hazards and other conditions that result in an inequality of exposure to these hazards among the states; (3) special conditions which create unequal burdens in the administration of equal public health services among the states indicated by the relative per capita cost of the operation and maintenance of state governmental services as shown by the Statistical Abstract of the Depart-

2. Physicians may be interested to know that this staff consists of eight men and twelve women. In addition, the A. M. A. Chemical Laboratory, composed of four Ph.D. chemists, besides the director and two assistants, devotes most of its time to the work of the Council. The membership of the Council consists of eighteen individuals. The Council carries on its work by means of a weekly bulletin containing from fifty to a hundred pages, and the members all return their votes and comments within a week after they have been received.

1. 5 Federal Register 22.

ment of Commerce for the years 1929-1933, and (4) the need for regional training centers. Allotments amounting to 29.1 per cent of available appropriations will be made to the several states on the basis of the financial needs of such states, "which is determined to be the ability of the state to raise revenue expressed indirectly in terms of differences in per capita five year mean income as computed by the National Industrial Conference Board." To be eligible to receive any of these federal funds, a state must submit a comprehensive statement of the state health organization, programs, appropriations and budgets, including all the activities maintained through local, state or federal funds under the supervision of or in cooperation with the state department of health. A state also must submit and have approved a proposed plan for extending and improving the administrative functions of the state department of health, including a state plan for a merit system of personnel administration and a proposed plan for extending and improving county, district and city health services. Except as revised by the new regulations, the regulations promulgated by the Surgeon General May 23, 1939,² for the distribution of federal funds for public health services, remain in effect. There would seem to be here an attempt toward appropriation where need exists and where trained personnel are available.

THE RELATION OF BRUCELLOSIS TO HODGKIN'S DISEASE

Recent observations by Parsons, Poston and Wise,¹ of the departments of pathology and bacteriology of Duke University, direct attention to the relation between chronic brucellosis and Hodgkin's disease. Only reports of a more or less preliminary nature are available; nevertheless these present the question clearly. In the cases studied the morphologic changes were characteristic of Hodgkin's disease, while *Brucella* (porcine or bovine) was obtained in cultures taken of the enlarged glands and in the one fatal case also of other structures. The cases may be spoken of as instances of "chronic brucellosis which presented a clinical and histologic picture strikingly similar to that of Hodgkin's disease." The microscopic changes include complete destruction of the normal architecture of lymph nodes, eosinophilia, areas of fibrosis and production of large, pale mononuclear cells as well as of giant cells of the Dorothy Reed or Sternberg type. The problem is presented whether this type of reaction can be caused by chronic brucella infection, that is to say whether Hodgkin's disease as the term now is used includes manifestations of chronic glandular brucellosis. This and related problems demand and no doubt will be subjected to further investigation in various places. Here it may be noted now that, while cultures of the lymph nodes studied by the Duke observers yielded *Brucella*, the serum of the patients concerned did not agglutinate *Brucella*. Other immune tests also were negative. The importance of this observation is a matter for future determination but it may be of fundamental as well as practical sig-

nificance. It appears that in certain forms of chronic brucellosis negative immune reactions do not exclude brucella infection; also that in cases diagnosed clinically as Hodgkin's disease microscopic examination may not tell the whole story—competent brucella cultural studies will be needed whatever the relation of brucellosis to Hodgkin's disease eventually is determined to be. The work under consideration is certain to create a new interest in chronic brucellosis and in Hodgkin's disease which there is good reason to hope may lead to a better understanding of the nature of chronic infectious granulomatous processes.

DIETARY IMMUNITY

Resistance to toxic or infectious agents apparently varies with nutritional conditions. According to Holt and Meyer,¹ of the Department of Pediatrics of Johns Hopkins University, this nutritional variation in toxin resistance is relatively specific, a diet increasing resistance against one toxic agent, for example, causing no change in resistance to a second toxic factor. In order to study the effect of diet on toxin resistance, the Baltimore clinicians placed parallel groups of carefully selected young rats on four qualitative variations of the same basic diet. Each variation contained adequate amounts of all known food factors, including vitamins and salts. The diets differed from one another solely in the relative amounts of protein (casein), carbohydrate (dextrose) and fat (lard). At the end of from two to four weeks on these diets all four groups were tested in parallel for their resistance to toxic agents, the test dose being so selected as to give about 60 per cent mortality in the group of rats maintained on the routine stock diet. In four groups tested by a subcutaneous injection of 0.6 Gm. of phenol per kilogram of body weight, for example, no consistent difference was noted between the mortality rates of the stock group and the groups on high fat or high carbohydrate diets. The group given a superabundance of protein in their daily rations, however, showed a mortality rate only about half of that in the control group. A high protein diet therefore increases phenol resistance. Quite different data were obtained in the four groups tested with 7 mg. of sodium cyanide per kilogram. Here the average mortality was 65 per cent in the three groups on high protein, high carbohydrate and the stock diet. The mortality, however, was only about half that, 33 per cent, in the group on a high fat diet. A superabundance of fat, therefore, causes an increased cyanide resistance. Even more striking differences were noted in the four groups tested with diphtheria toxin. Here the test dose was so selected as to kill two of three control rats in five days. Groups on the stock diet, high carbohydrate diet and high fat diet gave mortality percentages varying from 63 to 68 per cent in their series. In contrast, the high protein group showed a mortality rate of but 16 per cent. Normal antitoxic resistance to diphtheria toxin, therefore, is increased fourfold in effectivity on a high protein diet. No explanation of these quasispecificities have as yet been offered by the Baltimore clinicians.

2. 4 Federal Register 2165.

1. Parsons, P. B., and Poston, Mary A.: The Pathology of Human Brucellosis: Report of Four Cases with Autopsy, *South. M. J.* 32:7 (Jan.) 1939. Parsons, P. B.; Poston, Mary A., and Wise, Bowman: Pathology of Human Brucellosis, *Am. J. Path.* 15: 634 (Sept.) 1939.

1. Meyer, A. R.: *Proc. Soc. Exper. Biol. & Med.* 41: 402 (June) 1939.

ORGANIZATION SECTION

MESSAGE OF PRESIDENT ROOSEVELT ON CONSTRUCTION OF HOSPITALS IN NEEDY AREAS AND TEXT OF BILL INTRODUCED BY SENATOR WAGNER

Following is a copy of a message from the President to the Congress of the United States (House Document 604; *Congressional Record*, January 30). Following the receipt of the message, Senator Wagner, on behalf of himself and Senator George, of Georgia, introduced Senate Bill 3230 "to promote the national health and welfare through appropriation of funds for the construction of hospitals," which was referred to the Senate Committee on Education and Labor. Representative Lea, of California, introduced a companion bill in the House of Representatives, H. R. 8240, which was referred to the House Committee on Interstate and Foreign Commerce.

THE PRESIDENT'S MESSAGE

To the Congress of the United States:

In my special message to the Congress on January 23, 1939, I expressed my concern over the inequalities that exist among the states as to health services and resources with which to furnish such services. With that message I transmitted the report and recommendations on national health prepared by the Interdepartmental Committee to Coordinate Health and Welfare Activities and recommended it for careful study by the Congress.

Conditions described a year ago are substantially unchanged today. There is still need for the federal government to participate in strengthening and increasing the health security of the nation. Therefore, I am glad to know that a committee of the Congress has already begun a careful study of health legislation. It is my hope that such study will be continued actively during the present session, looking toward constructive action at the next. I have asked the Interdepartmental Committee to Coordinate Health and Welfare Activities to continue its studies.

In order that at least a beginning may be made I *now* propose for the consideration of the Congress a program for the construction of small hospitals in needy areas of the country, especially in rural areas, not now provided with them. Hospitals are essential to physicians in giving modern medical service to the people. In many areas present hospital facilities are almost nonexistent. The most elementary health needs are not being met.

The provision of hospitals in the areas to which I refer will greatly improve existing health services, attract competent doctors and raise the standards of medical care in these communities. The new hospitals should serve the additional purpose of providing laboratory and other diagnostic facilities for the use of local physicians, as well as accommodations for local health departments.

The proposed hospitals should be built only where they are most needed; they should not be constructed in communities where public or private institutions are already available to the people in need of service even if these institutions are not up to the highest standards. To insure proper location and good standards of operation, approval of hospital construction projects should be given by the Surgeon General of the Public Health Service, with the advice of an advisory council consisting of outstanding medical and scientific authorities who are expert in matters relating to hospital and other public health services.

Projects proposed for consideration should be submitted by responsible public authorities and should include assurance that adequate maintenance will be provided. Approval of projects should be preceded by careful survey of existing local hospital facilities and needs. Standards for organization, staff and continuing operation should be established by the Surgeon General, with the advice of the advisory council. A competent hospital

staff and satisfactory standards of service should be required, including medical, surgical and maternity service. When indicated, special provisions should be made for the care of the tuberculous. In many areas of the South, the present acute needs for the care of Negro patients should also be met.

I suggest that these hospitals be simple, functional structures, utilizing inexpensive materials and construction methods. The facilities of the Federal Works Agency should be utilized in the planning and execution of the hospital projects. Title to these institutions should be held by the federal government, but operation should be a local financial responsibility.

I recommend to the Congress that enabling legislation for this program be enacted and that a sum of between \$7,500,000 and \$10,000,000 be appropriated to the Public Health Service to inaugurate the program during the next fiscal year.

I am confident that even this limited undertaking will bring substantial returns in the saving of lives, rehabilitation of workers, and increased health and vigor of the people.

This suggestion is not a renewal of a Public Works program through the method of grants in aid. The areas which I have in mind are areas so poor that they cannot raise their share of the cost of building and equipping a hospital. Yet I believe that many of such communities have enough public-spirited citizens with means, and enough citizens able to pay something for hospital treatment, to care for operating costs of a hospital, provided they do not have to pay for its original construction and equipment, or to pay annual interest and amortization on borrowed money. Treatment in such a hospital would, of course, be available to men, women and children who literally can afford to contribute little or nothing toward their treatment.

One of the important difficulties in such areas at the present time is that young doctors hesitate to practice general medicine or surgery because of the utter lack of hospital or laboratory facilities. One cannot blame them.

In such areas also costs of construction are generally low and many local materials can be used. It is my belief that with the assistance of the Work Projects Administration the cost of building and equipping a hundred bed hospital can be kept down to between \$150,000 and \$200,000. This means that we could build fifty such hospitals for between \$7,500,000 and \$10,000,000.

This is not an ambitious project. This principle should not be extended to government gifts to communities which are financially able to build their own hospitals. It is an experiment in the sense that the nation will gain much experience by undertaking such a project.

At the very least it will save lives and improve health in those parts of the nation which need this most and can afford it least.

FRANKLIN D. ROOSEVELT

The White House,
January 30, 1940.

TEXT OF S. 3230, INTRODUCED BY SENATOR WAGNER

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Hospital Act of 1940."

SEC. 2. For the purpose of assisting states, counties, health or hospital districts, and other political subdivisions of the states in providing better health and medical services through the provision of needed hospital facilities to serve rural communities and economically depressed areas, there is hereby authorized to be appropriated to the Public Health Service for the fiscal year ending June 30, 1941, the sum of \$10,000,000 and for each

fiscal year thereafter such sums as the Congress may deem necessary for carrying out the purposes of this act. Amounts appropriated under this act shall be available until expended.

SEC. 3. States, counties, cities, other political subdivisions or parts thereof alone or in combination wishing to participate in the benefits contemplated by this act shall make application to the Surgeon General of the Public Health Service (hereinafter referred to as the Surgeon General). Said applications shall contain information necessary to establish the existence of need for hospitals, to give assurance acceptable to the Surgeon General that such hospitals will be made available under appropriate conditions to all groups of the population, will be maintained in good repair, and will be utilized in furnishing service of satisfactory quality, in accordance with regulations herein-after authorized to be prescribed.

SEC. 4. There is hereby established the National Advisory Hospital Council (hereinafter referred to as the "Council") to consist of the Surgeon General as chairman and six members to be appointed by the Surgeon General with the approval of the Federal Security Administrator. The six appointed members shall be selected from leading medical or scientific authorities who are outstanding in matters pertaining to hospitals and other public health services. Each appointed member shall hold office for a term of three years except that (1) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term, and (2) the terms of office of the members first taking office shall expire, as designated by the Surgeon General at the time of appointment, two at the end of the first year, two at the end of the second year, and two at the end of the third year after the date of the first meeting of the Council. No appointed member shall be eligible to serve continuously for more than three years but shall be eligible for reappointment if he has not served as a member of the Council at any time within twelve months immediately preceding his reappointment. Each appointed member shall receive compensation at the rate of \$25 per day during the time spent in attending meetings of the Council and for the time devoted to official business of the Council under this act, and actual and necessary traveling and subsistence expenses while away from his place of residence upon official business under this act.

SEC. 5. The Council is authorized to advise the Surgeon General with reference to the carrying out of the provisions of this act, including—

(a) The review of applications for hospitals submitted in accordance with and meeting the requirements of section 2 and recommendation of such projects as in its opinion are needed, will be adequately maintained, and otherwise will fulfil the requirements of this act;

(b) The formulation of standards which are necessary to insure proper conduct of the hospitals and care of persons served by the hospitals;

(c) The formulation of rules and regulations necessary to carry out the provisions of this act;

(d) The review of reports and inspections and, when necessary, the making of inspections with reference to professional service and standards of maintenance of the hospitals.

SEC. 6. In carrying out the purposes of this act, the Surgeon General is authorized and directed, after consultation with the Council—

(a) To conduct, assist and foster studies and surveys with respect to needs for hospitalization and problems of hospital operation;

(b) To approve hospital projects, to designate the location, type, equipment and size of hospitals, and to allocate available funds to such approved projects;

(c) To provide training and instruction of personnel who will be required in connection with the hospitals;

(d) To cooperate with state and local health and welfare authorities and with professional agencies;

(e) To secure reports and to make inspections with respect to professional service and standards of maintenance of the hospitals and other matters pertinent to carrying out the purposes of this act;

(f) To adopt such additional means as may be found necessary or appropriate to carry out the provisions of this act, including the safeguarding of the quality of service furnished in hospitals;

(g) To make, with the approval of the Federal Security Administrator, such rules and regulations as may be necessary to carry out the provisions of this act;

(h) To lease hospital projects when completed to the applicant for an indefinite period, the consideration for such lease being the maintenance and operation of said hospital in accordance with the provisions of this act. If at any time said maintenance and operation by the applicant shall fail to meet such provisions, the lease shall be terminated by the Surgeon General on six months' notice.

SEC. 7. When a hospital project has been approved by the Surgeon General, in accordance with the provisions of this act, it shall be certified by the Federal Security Administrator to the Federal Works Agency for construction and there shall be allocated and transferred to the Federal Works Agency, out of funds appropriated pursuant to this act, so much of the appropriation as may be determined to be available for the project, and the Federal Works Agency is authorized to expend such sums for the planning, execution and construction of the project and pertinent facilities, including administrative expenses, site acquisition, the preparation of working drawings and specifications, award of all necessary contracts and supervision of construction; and the Federal Works Agency is further authorized to expend out of appropriations available to it, in accordance with the purposes thereof, such sums as may be necessary for the completion of the project but without regard to specific limitations imposed on the use thereof. Title to the properties so constructed, and to the equipment installed therein, and to the land on which they are located, shall be in the United States.

SEC. 8. The Federal Security Administrator is authorized to accept on behalf of the United States gifts of money, equipment and land to be utilized in carrying out the purposes of this act.

SEC. 9. The President is authorized to allocate from funds appropriated pursuant to this act, for the fiscal year ending June 30, 1941, a sum for all necessary expenses of the Public Health Service in administering the provisions of this act, including the training of personnel; and there is hereby authorized to be appropriated in each succeeding fiscal year such amounts as the Congress may deem necessary for such purpose.

SEC. 10. (a) There is hereby authorized to be appointed in the Public Health Service, in accordance with applicable law, such additional commissioned officers and other personnel as may be necessary in carrying out the provisions of this act.

(b) On recommendation of the Surgeon General, the Federal Security Administrator shall submit to the Bureau of the Budget on or before September 15 of each year a list of approved hospital projects under this act and cost estimates thereof, together with such other data as may be necessary for the preparation of the budget estimates.

(c) This act shall not be construed as superseding or limiting (1) the functions, under any other act, of the Public Health Service or any other agency of the United States relating to the prevention, diagnosis and treatment of disease; or (2) the expenditure of money therefor.

(d) The term "state" as used in this act shall include also the territories and insular possessions of the United States.

(e) The term "hospital" as used in this act shall include the physical facilities necessary for the prevention, diagnosis or treatment of disease, and for the protection of the public health.

(f) The Surgeon General shall include in his annual report for transmission to Congress a full report of the administration of the act, including a detailed statement of receipts and disbursements.

(g) This act shall take effect thirty days after the date of its enactment.

AN ANALYSIS OF S. 3246, A BILL TO AUTHORIZE LOANS FOR HOSPITALS, WATER, SEWER, STREAM-POLLUTION CONTROL, AND RELATED PROJECTS AND FACILITIES

PREPARED BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION, AMERICAN MEDICAL ASSOCIATION, FEB. 5, 1940

This bill was introduced by Senator Mead, of New York, February 1. It proposes to authorize a federal appropriation of \$300,000,000 to remain available until expended to be utilized in making loans to public bodies and nonprofit organizations to finance the construction, equipment, repair, alteration, extension, improvement and "the temporary operation and maintenance for a period not exceeding four years" of:

(1) hospitals, defined to mean any institutions or facilities for the treatment of illness or disease, including any health, diagnostic or treatment center, station, institution or clinic;

(2) water and sewerage works and systems, including treatment plants and any and all constituent facilities thereof;

(3) works and systems for the reduction of pollution in streams; and

(4) related "facilities" necessary or proper to safeguarding the health of the people, where, in the determination of the Administrator of the Federal Works Agency, such "facilities" are now inadequate or nonexistent. (The bill is silent as to what is to be considered a "related facility.")

Of the sum to be authorized, not to exceed \$100,000,000 may be devoted to hospital projects and not to exceed \$9,000,000 will be made available during the fiscal year ending June 30, 1941, for administrative purposes in carrying out the provisions of the bill.

The bill contemplates that secured loans may be made by the Administrator of the Federal Works Agency to any public body, defined to mean any state, territory, possession or political subdivision, or an instrumentality or agency thereof, and to any organization not operating for profit, and created pursuant to law or under the authority of any public body. Loans will be repayable within a period not to exceed fifty years and will bear interest at the rate of 2 per cent a year.

With particular reference to hospitals, the bill provides that, to the extent not inconsistent with any pertinent state or territorial law, any public body or nonprofit organization receiving

a loan for the construction of a hospital or a hospital addition shall, on the request of the Surgeon General of the Public Health Service, make such hospital or hospital addition available to the federal government for operation by it during (1) a state of war or (2) a "national emergency," the public body or nonprofit organization to be compensated therefor in such an amount as the Congress shall determine to be just and reasonable. The bill does not define what shall constitute a "national emergency" nor does it indicate who is to determine the existence of an emergency so as to justify the Surgeon General of the Public Health Service in taking over the operation of a hospital or addition constructed with money made available by the bill.

The bill provides that it may be cited as the "Health Security Act of 1940." The administration of its provisions, however, is to be devolved solely, with the exception noted in the preceding paragraph, on the Administrator of the Federal Works Agency, who will be authorized to prescribe the terms and conditions on which loans may be made. While it relates to health security, it has been referred to the Senate Committee on Banking and Currency, of which Senator Wagner, of New York, is chairman and who himself on February 1 introduced another bill providing for the construction of hospitals, discussed elsewhere in this issue, which bill was referred to the Senate Committee on Education and Labor.

In submitting S. 3246, its author, Senator Mead, said in part:

"I wish to observe at the outset that my bill will in no wise conflict with a similar bill introduced by my distinguished colleague the senior Senator from New York [Mr. Wagner]. It will supplement the program he proposes, and it will permit applicants who otherwise would not be permitted to apply for funds for this purpose to qualify and, in the end, to build hospital facilities." (*Congressional Record*, Feb. 1, 1940, p. 1361.)

Representative Schulte, of Indiana, has introduced a companion bill in the House of Representatives, H. R. 8288, which was referred to the House Committee on Appropriations.

GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FLORIDA

Beginning in 1933 the Florida Medical Association has conducted each year a six day graduate short course for physicians. The course consists of six lectures in medicine, surgery, pediatrics and obstetrics and five lectures in gynecology, with the remainder of the time devoted to the clinical specialties. Round table discussions were held in 1934 and 1935. In 1935 there was a symposium on malaria and in 1936 a symposium on respiratory diseases and fractures. Exhibits and demonstrations have been attempted in tuberculosis, radiology, public health and pharmacy.

In 1933 the state medical association appointed a committee on medical postgraduate course. At first there were four and later six members of this standing committee. Representatives were appointed from each of six sections of the state with Dr. T. Z. Cason as chairman since the formation of the committee. The committee men are appointed for a three year period, serving overlapping terms.

The state association has allotted \$500 each year for the expenses of the committee's program. Actually less than \$300 has been spent of the total amount allotted by the state association over the past seven years, so that the per capita cost of instruction has been only slightly in excess of 50 cents. A registration fee of \$5 is charged each year. This is used for paying the traveling expenses of out of state instructors. Since

the committee is incorporated, it is financially independent of the state association. Commercial exhibits have not been attempted.

Instructors are selected by the postgraduate committee usually from the faculties of medical schools. It has been the custom to invite speakers for not more than two consecutive years. On the first year's program local University of Florida instructors participated, but since then only out of state physicians have constituted the faculty. Six or seven men are invited from various sections of the country to speak on subjects of current interest. The first four years' courses were held in Gainesville with the University of Florida General Extension Division cooperating. Notices were prepared by the state association's committee and published and distributed by the extension division, the division being compensated for this service. Attendance has ranged from 102 physicians the first year to 136 in recent years. Of the 2,072 physicians licensed in Florida, 1,346 are members of the state medical association.

In 1937 the university extension division continued to publish and distribute programs for the graduate short course, and the meeting was held in Orlando for the first time. Definite hours were assigned to each instructor, so that the teaching schedule was arranged from 8 a. m. to 5:30 p. m. each day. Attendance increased over previous years. Since 1937 meetings have been held at Daytona Beach.

In 1938 and 1939 the state board of health cooperated with the state medical association, replacing the extension division of the university. The state board of health published and distributed the programs for the postgraduate committee as well as paid instructors, who discussed such subjects as obstetrics, gynecology, pediatrics and venereal diseases.

In 1939 for the first time a short course of one week's intensive work in diseases of the chest was given in connection with the regular graduate short course. Seventeen physicians enrolled, each paying an additional fee of \$5. Hospital facilities at Daytona Beach and Orlando were utilized so that registrants might have an opportunity to study patients under the supervision of a competent teacher.

Over five years approximately half the membership of the state medical association has attended one or more graduate sessions. From a representative group of physicians who were questioned regarding their interest in the graduate short course, it was noted that about two of every five had attended the course given in Florida, about one of six engaged in graduate study elsewhere, and less than one of eight found some reason for not attending the state association's course. The majority favored the present plan and schedule. A number requested additional instruction in such subjects as urology, orthopedic surgery and radiology.

The Florida State Board of Health attempted in January and February 1937 to promote a program of graduate study in six cities in the northern section of the state. Six meetings were held at each locality. These section meetings were sponsored by each local medical society in cooperation with the state association's committees on maternal welfare and child health. One lecture in obstetrics and one in pediatrics were given each day and time was provided for consultations. Twelve out of state instructors were engaged. The same lectures were given on succeeding days throughout each week in each of the six cities. No registration fees were charged. The program was financed with federal funds.

During the past year the committee on medical postgraduate course has taken an active interest in the annual meetings of district societies throughout the state. A member of the state association's committee from each district represents the committee in his own district meeting. It is anticipated that some effort will be made to coordinate the programs of the district meetings with the programs of the annual graduate short course of the state association.

The Florida Tuberculosis and Health Association sponsored a three day course in the Florida State Hospital at Orlando in 1939. While the instruction was designed especially for health officers, others were invited to attend. During the past three years, instruction in tuberculosis for Negro physicians has been sponsored by the state tuberculosis and health association with the financial assistance of the Rosenwald Fund.

NORTH CAROLINA

A feature of the North Carolina plan of graduate education which is most appreciated by physicians of the state is the method of teaching by clinical demonstrations utilizing patients with diseases existing in the physician's own community—their problems of everyday practice. The physician sees modern diagnostic procedures applied at the home and his patient sees them and learns to appreciate and demand careful systematic examination. This tends to raise the standard of medical practice in the community.

Since the problem of postgraduate training is one primarily of education and only secondarily one of public health, in North Carolina it has been considered to be chiefly the concern of the state university rather than the state board of health, and as a result it has been undertaken largely by the university. The organization of classes, the planning of circuits for instructors and other executive work has been carried out by and financed by the university extension division. More strictly medical problems such as the selection of instructors and outline of the course have been in the hands of the medical school administration.

THE UNIVERSITY OF NORTH CAROLINA AND THE NORTH CAROLINA STATE BOARD OF HEALTH

Extension training for practicing physicians of North Carolina originated in Wilson County in 1916. Dr. W. S. Rankin, state health officer and secretary of the board of health, Mr. Chester D. Snell, director of the Extension Division of the University of North Carolina, and Dr. I. H. Manning, dean of the medical school, were concerned with the early development of the plan, which has been described briefly as follows: A lecturer is elected to discuss a subject of interest to physicians practicing in an essentially rural state. Definite days are fixed when the instructor is to appear at previously selected places on the circuit plan. He may spend from twelve to sixteen weeks in the state, appearing the same day each week at the same center. An eastern and a western circuit were developed for the state in 1916, the first year. There were twelve groups of physicians meeting in as many places on the two circuits. Since instruction in pediatrics was most desired, this subject was given by two members of medical faculties from outside the state. After an introductory lecture, from one to ten patients would be brought in for diagnosis, demonstration and discussion by the physicians enrolled in the course. One hundred and seventy-nine physicians registered the first year. The attendance averaged 76 per cent.

After an interruption during the World War period the courses were resumed, and in 1922 twelve localities were supplied by two out of state lecturers in the subject of internal medicine. The initial plan of organization and administration was followed. One hundred and ninety-nine physicians registered, attending 84 per cent of the lectures. Twenty-four groups on four circuits were addressed in 1923. The subjects were internal medicine and pathology. Four out of state physicians participated. Three hundred and eighty enrolled and the attendance continued at 84 per cent. In 1924 and 1925 pediatrics was repeated in twelve localities during each year. Two physicians constituted the traveling faculty in 1924 and three in 1925. The first year 176 physicians registered, the percentage of attendance being 82. In the second year 159 enrolled, with 76 per cent attendance. In 1926 and 1927 instruction in internal medicine was given and pediatrics was repeated in 1927. Three out of state physicians were engaged in 1926 and two in 1927. Attendance was 102 the first year and eighty-six the second year. In 1928 a course in physical diagnosis was given to seven groups of sixty physicians. One out of state instructor was responsible for this course.

During the first eight years eight courses were offered to ninety-one groups of physicians, meeting in forty-four centers located in forty-one counties of the state. Enrollment totaled 905 physicians. There are 2,663 licensed physicians in the state, of which number 1,801 are members of the Medical Society of the State of North Carolina.

Fourteen out of state instructors were engaged over this period. Physicians who enrolled for instruction paid \$30, which was sufficient to finance the traveling expenses and honorariums of instructors for a course of twelve or thirteen sessions. A minimum of fifteen registrants was required under this plan. A member of the Extension Division of the University of North Carolina accompanied the lecturer on his first appearance, introduced him to his audience and took complete charge of the financial arrangements. This procedure has been outlined by Mr. Chester Snell, director of the university extension division, as follows:

In the fall of 1921 I sent a letter outlining our scheme to the secretaries of all the county medical societies in the state, with the request that they bring our proposition up for discussion at their meetings and report back to me. The best responses came from the societies which had taken the work in 1916. In the spring of 1922 I obtained a list of all the doctors within 50 miles of the six selected cities, in the two sections, and sent to each an explanatory letter and an application blank. About forty were enrolled in this way. Next I interviewed personally a large number at the annual convention of the state medical society, which occurred later in the spring, and, following this, I made a personal office-to-office canvass, eventually signing up enough to make the total for the two circuits 180. Just before the first meeting I sent letters to all of the doctors who had been on the former mailing list, reminding them of the dates on which the first meetings were to be held and again soliciting their cooperation. Exactly 198 physicians enrolled, out of a total of about 450 approached. About 85 per cent of the general practitioners could be classified as interested or enthusiastic when first seen. The main difficulty in getting

an early response was due to the fact that when I made my field trip I could not announce the names of the instructors, as they had yet to be selected. Difficulty was occasionally experienced in overcoming, on the part of the more skeptical, a tendency to believe that the university was attempting to "put something over"; but we were usually able to meet this attitude successfully by a thorough explanation of our plan. As further evidence of good faith, we promised a refund to those enrolled in case our receipts more than covered the instructors' expenses. Each physician paid \$30 for the series and later received a refund of over \$3. I believe that, in the future, less difficulty will be experienced in organizing similar classes, for the work is now so firmly established that it should sell itself.

After a lapse of several years the statewide graduate program was revived, which had several of the features of the initial plan. The state board of health administered the program and lent financial aid with federal funds in 1935-1936. An advisory committee was legally constituted to represent the medical profession. This committee was composed of the president and secretary of the Medical Society of the State of North Carolina, the chairmen of the society's committees on maternal and child health, on obstetrics and gynecology and of its section on pediatrics, the chairman of the North Carolina chapter of the American Academy of Pediatrics and of a similar body in obstetrics, the president of the North Carolina Society of Pediatrics, the managing director of the state tuberculosis association and the president and secretary of the state health officers' association.

Beginning in 1935 a series of five illustrated lectures in obstetrics was given in each of the councilor districts of the state medical society. The extension division of the university again administered the course and the dean of the medical school provided instructors. The lectures were held in the fall of 1935 and in the spring and summer of 1936. There were ten sections of the state visited. The first three series were conducted by one instructor from out of the state, the next five by another and the last two by a third physician. Some of the lectures were illustrated with movie films. The sessions began at 2 p. m. and continued for three hours. There was a lecture followed by a showing of film and finally a general discussion. Approximately 600 practicing physicians received some instruction under this plan.

In the fall of 1936 the extension division of the university, the school of medicine and physicians practicing in the state resumed extension training similar to that attempted twenty years before. Under the new system circuits were abandoned in favor of established teaching centers conveniently located for men in general practice. A central committee was formed with the dean of the school of medicine as chairman and with the director of the extension division and Dr. William H. Smith, a member of the postgraduate committee of the state medical society, on this central committee. Before a teaching center is established the plan is approved by the local medical society, which appoints a committee to meet with a representative of the extension division and make local arrangements. An attempt is made to enroll approximately seventy-five physicians at \$15 per registrant. With this amount it is possible to employ six or seven lecturers from out of the state. The meetings begin with supper, which is followed by a lecture of one and one half hours' duration, after which there is a general discussion. Sometimes it is possible to hold late afternoon clinics in local hospitals. It has been found that one lecture a week for six times is most agreeable to physicians, many of whom travel great distances to attend a course. Only five areas of the state have had sufficient numbers of physicians to finance this undertaking. Negro physicians also may attend, coming in after supper and paying a smaller fee.

In 1936 eighty-six physicians enrolled for a course in general medicine and pediatrics. A total of 115 physicians attended one or more lectures. In 1937 115 enrolled and 150 attended a series of seven lectures in general medicine at another center. In 1938 four courses were given in as many centers on subjects of general interest with an enrolment of 371 and an attendance of 495 physicians. In 1939 three courses were given in three centers, 292 enrolling and 468 attending one or more lectures. It was possible for physicians either to enroll for the whole course or to pay a smaller fee and attend only lectures of special interest to them.

It is anticipated that it will be possible to extend this type of educational service to the more sparsely settled localities in the state where there are insufficient numbers of physicians to subscribe for a course. For this purpose it is hoped that a surplus will develop which will be sufficient to meet this need.

DUKE UNIVERSITY MEDICAL SCHOOL

Since 1934 Duke University Medical School has offered physicians of the state one or two symposiums each year on different subjects of medicine. The university provides facilities at the medical school for any doctor who wishes to spend a few days, weeks or months reviewing his knowledge of medicine, surgery, obstetrics, pediatrics or other divisions of clinical or preclinical medicine. Medical graduates from any part of the state may attend clinics and demonstrations in the major divisions of medicine on Saturdays from 9 a. m. to 12:30 p. m., and clinical pathologic conferences, which are held on Wednesday at 5 p. m.

In 1934 there was a three day fracture course, which was the initial effort of the university in this type of postgraduate training. In the fall of 1935 there was a three day course in gastro-enteric disease in which seventeen out of state physicians discussed diagnosis and treatment. In October 1936 there was a symposium on diseases of the heart, circulation and kidney in which sixteen out of state physicians participated. During this month there was a course on pulmonary diseases which was designed for Negro physicians. This course was given in cooperation with the University of North Carolina and Wake Forest College. In November 1937 there was a three day symposium on pediatrics, gynecology and obstetrics. Ten out of state physicians participated. In addition to the lectures in 1937 there were three round table discussions.

The house of delegates of the Medical Society of the State of North Carolina in May 1938 voted to sponsor intensive short courses for practicing physicians to be given at Duke University School of Medicine. A committee was appointed by the society to publicize these courses. Under this plan the university, as outlined above, permits physicians practicing in the state to spend one or more weeks in residence at the university for observing clinical procedures in the major divisions of medicine.

In January 1938 a one day symposium on pneumonia, which also included a technician course, was given. Eight members of the staff at Duke participated and moving pictures were shown. In October 1938 there was a three day symposium on medical problems at Duke University in which ten out of state and a number of North Carolina physicians participated. In January and February 1939 there was a university extension course in medicine in which there was one lecture each week by an out of state physician. Also in January 1939 the one day symposium on pneumonia was repeated, with two speakers participating. In March 1939 there was a two day graduate clinic for the diagnosis and treatment of syphilis. Seven out of state physicians participated.

WAKE FOREST COLLEGE

In January 1930 there was one day of lectures by an out of state physician on gastro-enteric disease. In December 1931 there was a similar lecture on nerve physiology. In December 1933 there was a two day series of talks on the diagnostic and treatment problems of cancer by four out of state physicians. In April 1938 there was a two day symposium and clinic on tumors in which four out of state physicians participated. Both the 1933 and 1938 discussions were well attended. Approximately 125 physicians enrolled for the 1938 session.

SOUTHERN PEDIATRIC SEMINAR

Each year in Saluda, N. C., is held the Southern Pediatric Seminar. A two weeks course of instruction is given in July or August every year in pediatrics and occasionally obstetrics is included. Lectures, clinics and symposiums are given in a local hospital. Instructors are chosen from medical schools of the South. Attendance in 1938 was forty-seven. There is a registration fee of \$25.

OFFICIAL NOTES

SPECIAL BLUE NETWORK BROADCAST

February 21 from 9 to 9:30 p. m. central standard time (10 to 10:30 eastern standard time, 8 to 8:30 mountain time and 7 to 7:30 Pacific time) there will be a special broadcast by the American Medical Association and the National Broadcasting Company over seventy stations of the Blue network. The subject will be "Pasteur Conquers Rabies."

The broadcast will be based on an article "Watch Your Dog!" appearing simultaneously in *Hygeia* and on official reports dealing with the seriousness of the rabies situation in the United States.

Special features of the program will be music arranged by Don Markotte of the National Broadcasting Company Music Library from the score which accompanied the motion picture production of Louis Pasteur, starring Paul Muni. This music

is made available through the special courtesy of Warner Brothers. An augmented N. B. C. orchestra, directed by Joseph Gallicchio, will render the music. Dramatizations taken from the life of Pasteur and arranged for radio by William J. Murphy will be enacted by a specially selected cast of N. B. C. radio actors, under the direction of J. Clinton Stanley, director of the series *Medicine in the News*.

A limited number of tickets for admission to the studio will be available to physicians in Chicago and vicinity. Tickets will be limited to two per application. Requests should be sent by mail to the Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago, enclosing a stamped, self-addressed envelop. Telephone requests cannot be received. Applications will be filled in the order in which they are received until all the tickets have been distributed.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Bills Introduced.—S. 3230, introduced by Senator Wagner, New York, for himself and Senator George, of Georgia, and H. R. 8240, introduced by Representative Lea, California, propose to authorize for the fiscal year ending June 30, 1941, the sum of \$10,000,000 and for each fiscal year thereafter such sums as the Congress may deem necessary, for the purpose of assisting states, counties, health or hospital districts and other political subdivisions of the states in providing better health and medical services through the provision of needed hospital facilities to serve rural communities and economically depressed areas. S. 3246, introduced by Senator Mead, New York, and H. R. 8288, introduced by Representative Schulte, Indiana, propose to authorize an appropriation of \$300,000,000 from which to make loans to public bodies and nonprofit organizations for hospital, water, sewer, stream-pollution control, and related projects and facilities. H. R. 8235, introduced by Representative Miller, Connecticut, proposes that persons who served during the World War with the American Red Cross, Knights of Columbus or any other auxiliary unit recognized by the Administrator of Veterans' Affairs shall be furnished the same domiciliary care and medical and hospital treatment as furnished by law or veterans' regulations to veterans of the World War suffering from non-service connected disabilities. H. R. 8238, introduced by Representative Summers, Texas, proposes to provide for the incorporation of the United Spanish

War Veterans, which includes in its membership acting assistant surgeons, contract physicians, dentists and veterinary surgeons.

DISTRICT OF COLUMBIA

Bills Introduced.—H. Res. 370, submitted by Representative D'Alesandro, Maryland, proposes to authorize an investigation of the conditions obtaining at the Home for the Aged and Infirm at Blue Plains. S. 3221, introduced by Senator King, Utah, proposes to regulate, in the District of Columbia, the disposal of certain refuse.

STATE MEDICAL LEGISLATION

Kentucky

Bill Passed.—H. 104 passed the House, January 30, proposing to require a physician or other person legally permitted to attend pregnant women to take or cause to be taken a specimen of blood for serologic tests for syphilis from such women as soon as he or she is engaged to attend the woman and has reasonable grounds for suspecting that pregnancy exists.

Mississippi

Bill Introduced.—H. 150 proposes to prohibit the retail sale or distribution of any drug or medicine that contains any quantity of any substance such as barbituric acid, except on the written prescription of a physician, dentist or veterinarian.

WOMAN'S AUXILIARY

Indiana

The board of directors of the auxiliary to the Indiana State Medical Association met in Indianapolis November 2. Plans for the year were presented by Mrs. W. E. Tinney, president, and by the chairmen of standing committees. Dr. Norman M. Beatty, chairman of the Committee on Public Policy and Legislation of the Indiana State Medical Association, discussed public relations and policies of the state association.

The auxiliary to the Vigo County Medical Society met in Terre Haute October 12. Mrs. J. R. Yung, hostess, spoke on Mexico. Forty members were present. The auxiliary gave a benefit bridge party November 6 to raise funds for occupational therapy work for children patients in the Union and St. Anthony's hospitals.

Nebraska

The auxiliary to the Lancaster County Medical Society met in Lincoln October 2 with thirty-five members in attendance. Mrs. Charles C. Tomlinson, Omaha, addressed the group. Mrs. Walter L. Albin addressed the meeting on November 6 on the

subject of her recent world tour. A project of the auxiliary is placing *Hygeia* in every school in the city of Lincoln.

West Virginia

The auxiliary to the Cabell County Medical Society met at Huntington November 9. Thirty-two members were present. Dr. A. E. McClue, Charleston, discussed the Social Security Act, and Dr. Raymond Sloan, Huntington, conditions among the indigent.

The auxiliary to the Kanawha Medical Society met in Charleston November 14, with thirty-eight members in attendance. Dr. R. O. Halloran, Charleston, was speaker, and articles from *Hygeia* were reviewed.

Mrs. V. E. Holcombe, president of the auxiliary to the West Virginia State Medical Association, addressed auxiliaries to the following county societies: Harrison, at Clarksburg, November 2; Logan, at Earling, November 7, and McDowell, at Welch, November 8.

The auxiliary to the Parkersburg Academy of Medicine met November 14, with twenty-five in attendance. Dr. W. A. Beracqua spoke on the subject "Becoming Acquainted with Social Agencies."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Arkansas Basic Science Act Constitutional.—The Supreme Court of Arkansas, January 15, in the case of *Stroud v. Crow*, upheld the constitutionality of the basic science act enacted by the legislature of that state in 1929. The case was prosecuted by the members of the executive board of the Arkansas Medical Society, suing in their official capacities and individually as licensed physicians, to enjoin the chiropractic board from issuing chiropractic licenses to persons not possessing basic science certificates, which it had been doing, and to enjoin certain chiropractors from continuing the practice of chiropractic under the purported authority of licenses issued to them by the chiropractic board contrary to the requirements of the basic science act. To the contention of the chiropractors that they did not treat disease and hence were not amenable to the requirements of the basic science act, the Supreme Court answered "If he [the chiropractor] does not treat diseases, what does he treat? Does he manipulate the vertebrae of a well person just for the pleasure of such well person? There would be no excuse for any regulatory chiropractic laws, if they were not engaged in treating disease." The court further held that the basic science act was not invalid because it required chiropractors to be proficient in bacteriology and pathology, two subjects not included in the chiropractic act, or because it exempted from its requirements dentists, nurses, midwives and certain others. The trial court had dismissed the complaint but the Supreme Court said that if chiropractors want to obtain licenses in Arkansas they must first comply with the basic science act. Peter A. Deisch, Esq., of Helena, was attorney for the medical society.

CALIFORNIA

Personal.—Dr. William A. Swim, Los Angeles, has been appointed a member of the state board of medical examiners, succeeding Dr. John MacLean, whose term expired. —Dr. Anthony J. J. Rourke, assistant director, University Hospital, Ann Arbor, Mich., has been appointed medical superintendent of the Stanford University Hospitals, San Francisco, and assistant professor in the university school of medicine.

DISTRICT OF COLUMBIA

Regional Meeting on Pediatrics.—The annual meeting of region 1 of the American Academy of Pediatrics will be held April 4-6 at the Mayflower Hotel, Washington, with District members of the academy acting as hosts.

Joint Meeting of Gynecologists.—Four honorary fellowships were announced by the Washington Gynecological Society at its joint meeting in Washington with the Obstetrical Society of Philadelphia, January 18. The fellowships were conferred on Drs. Jennings C. Litzenberg, professor of obstetrics and gynecology, University of Minnesota Medical School, Minneapolis; Dr. Nicholson J. Eastman, professor of obstetrics, Johns Hopkins University School of Medicine, Baltimore; Marvin Pierce Rucker, Richmond, Va., and Norris W. Vaux, professor of obstetrics, Jefferson Medical College, Philadelphia. The morning program consisted of four round table discussions on the following subjects: obstetric analgesia and anesthesia; induction of labor, indications and methods; hysterectomy—total versus subtotal, and sterility, diagnosis and treatment. The speakers in the afternoon program included Carl Voegtlin, Ph.D., of the National Cancer Institute, who gave the address of welcome, and the following:

Dr. Harold L. Stewart, Bethesda, Md., Pathologic Anatomy of Mammary Tumors in Mice.
Harold B. Anderson, Sc.D., senior biologist, U. S. Public Health Service, Influence of Inbreeding and Foster Nursing on Spontaneous Mammary Tumors in Mice.
Harold P. Morris, Ph.D., Relation of Some Essential Amino Acids to the Growth of Mammary Tumors.
Dr. Michael B. Shimkin, Bethesda, Md., "Carcinogenicity" of Estrone and Stilbestrol.

The program included clinics at the Garfield Memorial Hospital, Gallinger Municipal Hospital and the health department clinic. The speakers at the dinner included Drs. Thomas B.

Lee, Camden, N. J., president of the Obstetrical Society of Philadelphia, George M. Laws, Clifford B. Lull, Norris W. Vaux, Francis Sidney Dunne, Philadelphia; James H. Underwood, Woodbury, N. J., and Fred B. Nugent, Reading, Pa.

GEORGIA

Personal.—Dr. Jack R. McMichael, Quitman, has been appointed a member of the state board of health, succeeding Dr. Cyrus K. Sharp, Arlington. —Dr. George M. Anderson, Eastman, is reported to have resigned as health officer of Dodge County, effective December 31.

The L. C. Fischer Awards.—Drs. William Howard Hailey and Hugh E. Hailey, Atlanta, have received the annual Dr. L. C. Fischer Awards, presented through the Fulton County Medical Society, for their paper on "Familial Benign Chronic Pemphigus." The award of \$100 was given for the paper showing the best research. For the best written paper, Dr. David Henry Poer won the award for his paper entitled "Clinical Experience with Use of Dihydrotychosterol (A. T. 10) in the Treatment of Ten Cases of Hypoparathyroidism—A Comparison with Parathyroid Hormone and Vitamin D₂."

ILLINOIS

Fellowships in Medicine and Dentistry.—The Graduate School of the University of Illinois has established four research fellowships to be awarded for one year in the fields of medicine and dentistry in Chicago at a stipend of \$1,200 a year (calendar year with one month's vacation). Fellows are eligible for reappointment in competition with new applicants. Candidates for these fellowships must have completed a training of not less than eight years beyond high school graduation. The training may have been acquired in any one of the following ways or the equivalent thereof:

1. Work leading to the B.S. and M.D. degrees (in some instances the candidates would have the M.S. degree or an additional year or two of hospital training beyond the intern year).
2. Work leading to the B.S., M.S. and D.D.S. degrees.
3. Work leading to the B.S. or B.A. degree in a four year collegiate course and to the D.D.S. degree.
4. Work leading to the B.S., D.D.S., and M.D. degrees.

Candidates should indicate the field of research in which they are interested and submit complete transcripts of their scholastic credits, together with the names of three former science teachers as references. March 1 is the deadline for acceptance of applications. Announcement of the fellowship awards will be made on April 1, becoming effective on September 1. Formal application blanks may be secured from the secretary of the committee on graduate work in medicine and dentistry, 1853 West Polk Street, Chicago.

Chicago

Public Lecture by Dr. Musser.—A public lecture, sponsored by the Chicago Medical Society and the Chicago Heart Association, was delivered on February 7 by Dr. John H. Musser, professor of medicine, Tulane University of Louisiana School of Medicine, New Orleans, on "The Growing Importance of Coronary Disease."

Joint Meeting on Urology.—A joint meeting of the Chicago, Cleveland and Detroit Urological societies was held at the Palmer House January 25. Dr. Charles Morgan McKenna addressed the meeting on "Problems in the Diagnosis of Renal Tumors" and Drs. Harry W. Plagemeyer, Detroit, and William E. Lower, Cleveland, gave the discussions. Dr. Vincent J. O'Connor spoke on "The Treatment of Renal Tumors" and Drs. Reed M. Nesbit, Ann Arbor, Mich., and James J. Jolson, Cleveland, were the discussants. A clinical meeting was held in the morning at the Billings Hospital.

Dr. Hamilton Anderson Goes to China.—Dr. Hamilton Anderson, of the staff of the Council on Medical Education and Hospitals of the American Medical Association, has resigned, effective February 15, to accept a professorship in pharmacology at Peiping Union Medical College, Peiping, China. Dr. Anderson graduated at the University of California Medical School in 1930 and joined the division of pharmacology the same year. He served as assistant clinical professor from 1934 until 1937, when he joined the staff of the American Medical Association. He engaged in field studies on amebiasis for the university at the Gorgas Memorial Laboratory, Panama, in 1931, and on leprosy at the Instituto Oswaldo Cruz, Rio de Janeiro, Brazil, in 1934. Dr. Anderson plans to sail from San Francisco for Peiping, March 22.

Society News.—Dr. Henry P. Wagener, Rochester, Minn., addressed the Chicago Ophthalmological Society January 15 on "Clinical Significance of Retinal and Choroidal Arterio-

sclerosis."—A symposium on the cement industry was presented before the Chicago Tuberculosis Society January 18 by Mr. A. J. R. Curtis, assistant general manager, Portland Cement Association; Drs. Clarence O. Sappington and Milton H. Kronenberg, all of Chicago.—The Chicago Neurological Society was addressed January 18, among others, by Drs. Alexander R. MacLean, Rochester, Minn., on "Relationship of Orthostatic Hypotension to Myasthenia Gravis" and Norman Reider, Topeka, Kan., "Aphasia Due to Exsanguination."—Dr. George L. Streeter, Carnegie Institution of Washington, Baltimore, discussed "Episodes in the Doctrine of the Three Germ Layers" before the Chicago Gynecological Society January 19.—At a meeting of the Chicago Society of Industrial Medicine and Surgery January 23 the speakers were Drs. James K. Stack on "Structural Hand Injuries and Their Repair: Bone Injuries of the Wrist and Hand"; Michael L. Mason, "Repair of Tendon Injuries of the Hand," and Paul W. Greeley, "Plastic Repair of Cutaneous Injuries to the Hand."—Dr. Ernest E. Irons was chosen president of the Society of Medical History of Chicago, January 31; other officers are Drs. George H. Coleman, secretary-treasurer; Morris Fishbein, editor of the *Bulletin*, and the following councilors: Ludvig Hektoen, James B. Herrick, William A. Pusey, David J. Davis, James P. Simonds and Arthur F. Abt.

KENTUCKY

Physicians Honored.—Drs. Daniel M. Griffith and John C. Hoover, Owensboro, and John M. Clayton, West Louisville, were guests of honor at a dinner given by the Daviess County Medical Society in Owensboro in December, in tribute to their long years of service. All have practiced more than fifty years. Dr. Robert Haynes Barr, Owensboro, was master of ceremonies and the speakers were Drs. Granville S. Hanes, Louis Frank and Virgil E. Simpson, all of Louisville, and Leslie C. Dodson, William L. Tyler Sr. and Otway W. Rash, all of Owensboro.—M. H. Dailey, D.D.S., and Dr. John A. Gilkey, Paris, were honored at a banquet given by the Bourbon County Medical Society, Paris, January 18, in recognition of their many years of service to the community.

Society News.—Dr. Henry C. Sweany, Chicago, addressed the Jefferson County Medical Society, Louisville, recently on "Some Important Complications of Tuberculosis." Dr. Bayard T. Horton, Rochester, Minn., was the guest speaker December 18 on "Use of Histamine and Histaminase in Clinical Medicine."—Dr. Hans Brunner, Chicago, addressed the Louisville Eye and Ear Society January 11 on "Pathologic Changes in the Middle Ear After Radical Mastoid Operation."—Drs. Charles D. Cawood and Richard G. Elliott II, Lexington, addressed the Bourbon County Medical Society, Paris, in December on "Present Day Knowledge of Poliomyelitis" and "Diagnosis and Treatment of Poliomyelitis" respectively.—Dr. Samuel A. Overstreet, Louisville, addressed the Whitley County Medical Society, Corbin, January 8, on treatment of ulcer of the stomach.

MAINE

Society News.—Dr. Grantley W. Taylor, Boston, recently discussed "Management of Carcinoma of the Breast" before the Cumberland County Medical Association.—At a meeting of the Kennebec County Medical Association in Augusta, December 21, Dr. John H. Talbott, Boston, spoke on "Water and Salt Metabolism."

MARYLAND

Dr. Perrin Long Named to New Department.—Dr. Perrin H. Long, associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore, has been appointed head of a new department of preventive medicine at the school. The department was established through a grant from the Rockefeller Foundation, allowing \$350,000 during the next ten years, according to *Science*. A graduate of the University of Michigan Medical School, Ann Arbor, 1924, Dr. Long served as assistant and associate with the Rockefeller Institute for Medical Research, New York, from 1927 to 1929, when he went to Johns Hopkins.

MICHIGAN

The Beaumont Lectures.—Dr. Alfred Blalock, professor of surgery, Vanderbilt University School of Medicine, Nashville, Tenn., delivered the annual Beaumont lectures of the Wayne County Medical Society, Detroit, February 5-6. His subject was "Surgical Therapeutics: A Consideration of Shock and Other Problems."

Graham Davis Heads Hospital Program.—Graham L. Davis, who has been associated with the Duke Endowment in Charlotte, N. C., since 1924, has been appointed director of the rural hospital program of the W. K. Kellogg Foundation, Battle Creek, according to *Modern Hospital*. Mr. Davis, assistant to Dr. Watson S. Rankin, Charlotte, N. C., trustee of the Duke Endowment and director of its hospital and orphans' section, is a member of the council on administrative practice of the American Hospital Association and chairman of the committee on accounting and statistics.

Michigan Basic Science Act Constitutional.—According to the January 24 issue of the *Detroit Legal News*, the Circuit Court of Wayne County has upheld the constitutionality of the Michigan basic science act, passed in 1937, in the case of *George Timpona and Marie Hyland Timpona, his wife, v. Brown et al.* The court said that it cannot be denied that the purpose and effect of the basic science act are salutary and that it represents another step forward in the movement which has received frequent legislative endorsement in recent years to protect the public health by requiring those who undertake to cure human ailments to be well qualified in their various professions. The purpose of the act, the court said, is certainly in conformity with high public policy when it insists that practitioners be well grounded in those rudimentary scientific subjects which underlie the healing art. The court dismissed as being without validity a contention made by the plaintiffs that the basic science act was unconstitutional because of the fact that it exempted dentists from its requirements.

MINNESOTA

J. G. Halland Sentenced Again.—John G. Halland, who was formerly licensed to practice medicine in Minnesota, was sentenced at Slayton to a term of fifty days in the Cottonwood county jail recently. Judge J. K. Campbell found Halland "guilty of interfering with the rural schools of Murray County by frightening the teachers and inspecting school records without proper authority from the county superintendent or the commissioner of education." Halland graduated at the University of Minnesota Medical School in 1919 with the degree of bachelor of medicine. His license was revoked by the state board in 1931 because of habitual indulgence in the use of drugs. In 1925 he served one year in jail at Santa Fe, N. M., for a violation of the federal narcotic law, according to the state board. In 1928 he served fourteen months in the federal penitentiary at Leavenworth, Kan., for a similar offense committed at Denver. In 1932 he served seventy days in the Minneapolis Workhouse. In September 1933 he pleaded guilty in the district court at Fergus Falls to an information charging him with practicing medicine without a license. At that time he was given a suspended sentence of six months.

NEW YORK

Society News.—Dr. James Ewing, New York, addressed the Medical Society of the County of Westchester, White Plains, January 16, on "Advantages of Local Control of Cancer Service." The society cooperated with the cancer clinics of hospitals in the county and with the official and voluntary agencies interested in cancer in presenting an exhibit on cancer, January 13-17. Drs. Lewis Gregory Cole and his son, Dr. William Gregory Cole, received the first James Ewing Award, a scroll presented by the county society for a meritorious exhibit contributing to understanding and control of malignant diseases.—Drs. George Porter Robb and Israel Steinberg, New York, addressed the Nassau County Medical Society, Garden City, January 30, on "Visualization of the Chambers of the Heart and of the Thoracic Blood Vessels," discussing disease of the heart and of the lungs, respectively.

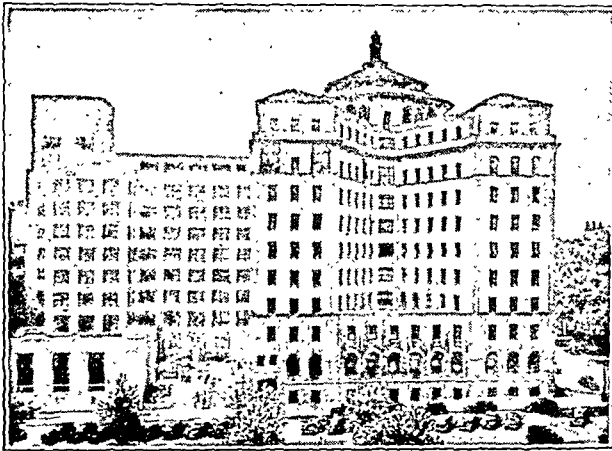
New York City

Fifth Harvey Lecture.—Homer W. Smith, Sc.D., professor of physiology, New York University College of Medicine, will deliver the fifth Harvey Lecture of the current series at the New York Academy of Medicine, February 15, on "Physiology of the Renal Circulation."

Alumni Program.—The Alumni Association of New York University College of Medicine will hold its annual Alumni Day program on February 22. The general subject will be "Modern Aspects of Preventive Medicine." In the morning, papers will be presented by Drs. Harry S. Mustard, Frank A. Calderone, Evan W. Thomas, Mortimer D. Speiser and Robert S. Hotchkiss. Speakers on the afternoon program will be Drs. Leonard J. Goldwater, Thomas Francis Jr., Elaine P. Ralli and Norman H. Jolliffe. At a noon luncheon there will be addresses by Drs. John L. Rice, health commissioner of

New York; Samuel A. Brown, dean emeritus of the medical school; Currier McEwen, dean, and the chancellor of the university, Harry Woodburn Chase, Ph.D. Dr. James W. Smith is president of the association.

New Medical College Building Dedicated.—The New York Medical College, Flower and Fifth Avenue Hospitals recently dedicated a new \$1,500,000 building for the college. Harold Willis Dodds, Ph.D., president of Princeton University, Princeton, N. J., made the dedicatory address and other speakers were Mr. Charles D. Halsey, chairman of the board of trustees; Mayor La Guardia, and Dr. Lewis Hill Weed, Baltimore. The new building is nine stories high and is connected floor by floor with the Flower and Fifth Avenue Hospitals. On the first floor are the administrative offices and an auditorium that will seat about 400 persons. The library and other student facilities are on the second and arrangement of the other floors is as follows: third, chemistry and physiology laboratories, with the necessary offices and conference rooms; fourth, department of medicine; fifth, histology and embryology and bacteriology laboratories; sixth, clinical pathology; seventh, department of anatomy; eighth, pathology, and ninth, department of surgery. An attempt has been made to locate the laboratories in the college building in close proximity to the sources of their work in the hospital; for example, the



New home of New York Medical College.

pathology laboratory is on the same floor as the operating rooms. The building also includes a new outpatient department with an entrance on One Hundred and Fifth Street; the college building opens on One Hundred and Sixth Street.

NORTH CAROLINA

Changes in Health Officers.—Dr. Frank E. Wilson, Williamston, has been appointed health officer of Edgecombe County, succeeding Dr. Lorenzo L. Parks, who resigned to join the state health department of Florida, it is reported. Dr. John W. Williams, formerly of Monroe, La., has succeeded Dr. Wilson in Martin County. Dr. Ralph J. Sykes, Weldon, recently health officer of Halifax County, has resigned to join the staff of the state health department.

OHIO

Society News.—Dr. Jacob R. Buchbinder, Chicago, addressed the Montgomery County Medical Society, Dayton, January 19, on "Recognition and Treatment of Acute Suppurative Pericarditis." Dr. Norris J. Heckel, Chicago, addressed the Academy of Medicine of Toledo and Lucas County, January 12, on "Diagnosis and Treatment of Sterility in the Male." Dr. James B. Herrick, Chicago, addressed the Cleveland Medical Library Association at its annual meeting, January 19, on "Jean-Baptiste Bouillaud and His Contributions to Heart Disease."

Physicians Honored.—Six members of the Fairfield County Medical Society who have practiced more than forty years were honored at a dinner given by the society in Lancaster, January 4. The guests were Drs. George P. Huddle, Stoughtonville; Adelbert V. Lerch, Pleasantville; Charles M. Alt, Baltimore, and George O. Beery, Charles A. Barrow and George W. Beery, Lancaster. Dr. Frank H. Stuke, Lancaster, president of the society, presided. A plaque was presented to each

honored guest.—Drs. William K. Ruble and Austin C. Roberts, Wilmington, were guests of honor at a dinner given by the Clinton County Medical Society in Wilmington, January 16, in recognition of their long careers in medicine. Dr. Ruble, who recently retired after seventeen years as health officer of Clinton County, entered practice in 1890 after graduating from Eclectic Medical College, Cincinnati, and Dr. Roberts began practice in 1890 after his graduation from Starling Medical College, Columbus. Dr. Leland H. Fullerton, New Vienna, president of the society, was toastmaster at the dinner.

OKLAHOMA

Society News.—Drs. W. J. Trainor and Fred E. Woodson, Tulsa, addressed the Garfield County Medical Society, January 25, on "Causes of Cardiac Failure" and "Selection of an Anesthetic for the Cardiac Patient" respectively.—Dr. John L. Emmett, Rochester, Minn., addressed the Pottawatomie County Medical Society, Shawnee, January 15, on "Excerpts from Medical History."

Course in Pediatrics.—A two year postgraduate program of lectures in pediatrics will begin on February 12 with a circuit of towns in northeastern Oklahoma. Drs. Hugh McCulloch and Wayne A. Rupe, St. Louis, will be the first lecturers. The Commonwealth Fund and the state health department are cooperating in financing the course, which has been arranged by the committee on postgraduate education of the state medical association.

OREGON

Postgraduate Course on Heart Disease.—The department of medicine of the University of Oregon Medical School, Portland, announces a postgraduate course on heart disease, February 26-28. Thirty-three lectures are listed in the program, which will be presented in morning and afternoon sessions and evenings of the first two days. The fee will be \$15.

The Jones Lectures.—Dr. Herbert M. Evans, professor of anatomy and Morris Herzstein professor of biology, University of California Medical School, Berkeley, gave the annual N. W. Jones Lectures at the University of Oregon Medical School, Portland, January 18-19. His subjects were "New Light on the Biological Role of Vitamin E" and "Some Unsolved Problems in Anterior Pituitary Physiology."

Society News.—Dr. Harold K. Faber, San Francisco, addressed the Portland Academy of Medicine January 25-26 on "Active Immunization in Pertussis and Tetanus" and "Some Problems in Poliomyelitis." Dr. Faber was also the guest of the North Pacific Pediatric Society January 27, conducting a clinic at Doernbecher Hospital and leading a round table discussion on active immunization of tetanus and whooping cough. Dr. Edwin E. Osgood, Portland, also addressed the pediatric meeting on "Some Recent Observations on Chemotherapy Using Bone Marrow Culture" and Dr. Joseph B. Bilderback, Portland, was a special guest as president of the American Academy of Pediatrics.—Dr. Leo S. Lucas, Portland, addressed the Multnomah County Medical Society, Portland, January 3 on "Physiotherapy in Orthopedic Surgery."—Drs. Lionel D. Prince, San Francisco, and Leo L. Stanley, San Rafael, Calif., addressed the Central Willamette Medical Society, Eugene, recently on "Fractures of the Patella" and Medical Problems of the State Penitentiary" respectively.—Dr. Frank W. Lynch, San Francisco, gave three lectures before the Polk-Yamhill-Marion Counties Medical Society in Salem December 11 on "Cancer of the Uterus," "Prolapse of the Uterus" and "Uterine Bleeding."

PENNSYLVANIA

Epidemic Meningitis.—Twenty-five persons have been stricken with spinal meningitis in Wilkes-Barre since January 1 and thirteen have died, newspapers reported, January 30.

Philadelphia

Dinner in Honor of Dr. Pfahler.—The Philadelphia Roentgen Ray Society sponsored a dinner in honor of Dr. George E. Pfahler, professor of radiology, University of Pennsylvania Graduate School of Medicine, January 25, at the Warwick Hotel. Dr. Eugene P. Pendergrass was toastmaster and the speakers were Drs. Joseph E. Roberts Jr., Camden, N. J., president of the society; Francis F. Borzell, president-elect of the Medical Society of the State of Pennsylvania; George H. Meeker, LL.D., dean of the graduate school of medicine, and Dr. Joseph McFarland, emeritus professor of pathology, University of Pennsylvania School of Medicine. The program

was a large fol- gnatures of several hundred physicians, from many parts of the country, and a ahler.

Site for Convalescent Hospital.—Fulfilling the terms of a bequest made in 1923, a site has been purchased for the erection of the Magee Memorial Hospital for Convalescents. Mrs. Anna J. Magee, who died on Dec. 12, 1923, left \$600,000 to found and endow an institution "whose object shall be the relief of the general hospitals of the city of Philadelphia from the burden of the support of patients who have passed through the active stages of acute illness." The terms of the will stipulated that the hospital should be controlled by a board of trustees representing eleven Philadelphia hospitals and the physician of the new convalescent hospital. The latter is to be the incumbent professor of medicine at Jefferson Medical College. Children under 14 years of age and persons suffering from incurable or contagious disease will not be admitted. The principal fund left by Mrs. Magee has been allowed to accumulate during the years since her death. The site of the new hospital, which will have between seventy-five and 100 beds, is an elevation overlooking Fairmount Park.

PHILIPPINE ISLANDS

Society News.—At the October meeting of the Manila Medical Society the speakers were Drs. Paterno S. Chikiamco and Clodualdo T. Orquiza on "Roentgen Diagnosis of Ascariasis in the Gastrointestinal Tract"; Geminiano de Ocampo, "The Role of Ophthalmology and Otolaryngology in Some Problems of Internal Medicine"; Gervasio Santos Cuyugan, Fortunato S. Guerrero and Pedro T. Nery, "Tuberculosis of the Cecum."—Dr. Fernando G. Medina, among others, addressed the Cavite Medical Society in October on "Frequency of Errors in the Differential Diagnosis Between Pneumonia and Bronchial Asthma and Gastrointestinal Diseases."—Dr. Eugenio Alonso, Cebu, addressed the Cebu Medical Society in October on "Blood Typing in Establishing Paternity."

PUERTO RICO

Sanitation Facilities in Rural Areas.—The Department of Health of Puerto Rico is building sanitary facilities in the rural areas of the island as a part of the anti-hookworm campaign with a fund of \$450,000 allotted by WPA and \$130,000 appropriated by the insular government. It is planned that 25,000 units will be built by June 30, when the work must be completed.

Study of Diarrhea and Enteritis.—The U. S. Public Health Service, in cooperation with the Puerto Rico Department of Health, is extending to the island a study of diarrhea and enteritis that has been carried on in certain areas of the United States. Dr. Albert V. Hardy will direct the study and Dr. James L. Watt of the public health service will assist in carrying out the project at the biologic laboratory in San Juan.

GENERAL

Base Hospital Reunion Planned.—All officers, enlisted men and nurses who were connected with the U. S. Army Base Hospital at Camp Sevier, S. C., during the war period 1917-1919 are asked to communicate with Mr. Mahlon R. Callaway, 566 West Third Street, Dayton, Ohio, concerning plans for a proposed reunion. Mr. Callaway, a former enlisted man, is the organizer of the U. S. Army Base Hospital Camp Sevier Reunion Association.

Society News.—Dr. John Cotten Tayloe, Washington, N. C., was elected president of the Seaboard Medical Association of Virginia and North Carolina at its annual meeting at Virginia Beach, Va., December 12-14. Dr. Clarence Porter Jones, Newport News, Va., was reelected secretary. Among the speakers were Drs. Raymond A. Vonderlehr, U. S. Public Health Service, Washington, D. C., on the program for control of syphilis and Edwin P. Lehman, Charlottesville, Va., on diagnosis of cancer of the breast.

Examination by Board of Obstetrics.—The general oral and pathologic examinations (part II) of the American Board of Obstetrics and Gynecology for all candidates (groups A and B) will be conducted by the entire board at the Atlantic City Hospital, Atlantic City, N. J., from Friday June 7 through Monday June 10, prior to the meeting of the American Medical Association. Candidates are requested to notice that the dates of the examinations have been advanced one day from those previously announced. Application for admission to group A, part II examinations must be filed with the secretary not later than March 15. Candidates for reexamination in part II must make written application before April 15. The

board's annual dinner will be held at the Hotel McAlpin, New York, June 12. For further information and application blanks, address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh.

Campaign to Extend Birth Control.—At the annual meeting of the Birth Control Federation of America in New York, January 24, plans were made for a campaign to extend and develop the movement for birth control. Dr. Woodbridge E. Morris, New York, general director of the federation, is chairman of the newly formed National Committee for Planned Parenthood, which will conduct a campaign for \$289,117 to finance the federation for the fiscal year 1940-1941. The committee is divided into groups representing education, religion, public health and medicine, social welfare, science, literature, business, law and philanthropy and women in civic affairs. The group representing public health and medicine are Dr. Carl V. Reynolds, Raleigh, health officer of North Carolina, said to be the first state to include birth control in its public health program; Charles-Edward A. Winslow, Dr. P.H., New Haven, Conn., and Miss Annie W. Goodrich, dean emeritus of the Yale University School of Nursing. Dr. Hans Zinsser, Boston, with Earnest A. Hooton, Ph.D., professor of anthropology at Harvard University, Boston, represent science.

Beware of Fraudulent Salesmen.—The California State Board of Medical Examiners recently reported the activities of one Logan Matthew Franey, who is said to be posing as a salesman for the medical book store of J. W. Stacey, Inc., San Francisco, after having been discharged by that firm. Franey was employed in October 1939 and sent to Seattle. The Stacey firm was informed by the librarian of the King County Medical Society, Seattle, that Franey had sold as his own certain books belonging to the company. It appeared that he had converted to his own use about \$150 worth of books. Cash advances amounting to \$125 had also been made to him and he had a gasoline credit card with which he had run up an account of \$142.04. Gasoline receipts show that he had been in Washington, Montana, Idaho and Oregon during October and November. As Franey retained a list of prospects furnished by the Stacey firm, physicians are warned to watch for him.—The American Surgical Trade Association reports again that swindlers are calling on physicians and hospitals claiming to represent surgical dealers. These swindlers obtain surgical instruments under the pretense that they will be repaired or replated. The instruments are not returned. Recently a man made a practice of calling on hospitals, claiming to be employed by a manufacturer of compressors and pumps and offering to repair the apparatus belonging to the hospital at reasonably low prices. The association urges physicians and hospitals not to turn over surgical instruments to strangers without absolute proof of their identity and authority.

CANADA

Gross Memorial Lecture.—Dr. Maude E. S. Abbott, Montreal, gave the second annual Louis Gross Memorial Lecture at the Jewish General Hospital, Montreal, recently. Dr. Abbott's subject was "The History of Medicine in the Province of Quebec."

Society News.—Dr. James Herbert Mitchell, Chicago, addressed the Academy of Medicine of Toronto December 5 on "Differential Diagnosis and Treatment of Cutaneous Lesions of the Hands and Feet." Dr. Paul M. Wood, New York, was the guest speaker at a meeting of the section of anesthesia January 29 on "Preoperative and Operative Care of the Handicapped Patient Suffering from Anoxemia."

Cancer Clinic in Saskatchewan.—The Saskatchewan Cancer Commission, the provincial department of health and the Regina Grey Nuns Hospital have recently cooperated in the construction of a special building for diagnosis and treatment of cancer, said to be the first in Canada designed especially for this purpose. The building is a four story wing on the Grey Nuns Hospital erected at a cost of \$150,000. Offices, examination and treatment rooms and a surgery are on the second floor; the third and fourth have twenty beds each. The Saskatchewan Cancer Commission was formed in 1930 by the department of health and shortly opened clinics in Regina and Saskatoon, with about 2.5 Gm. of radium. The volume of work grew until two full time physicians were appointed for the Regina Clinic in 1939 and it was moved from the Regina General Hospital to the Regina Grey Nuns Hospital. Other agencies interested have been the cancer committee of the Saskatchewan College of Physicians and Surgeons and the Saskatchewan Branch of the Canadian Society for the Control of Cancer.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 10, 1940.

Transportation by Air of Blood for Transfusion

In previous letters the arrangements for a blood transfusion service in the war on a scale never known before were described. As stated, transportation by air plays an important part and further details are now available. There is a fleet of aircraft to carry blood from the depots in which it is stored to the hospitals. A wire crate containing ten bottles of blood is the unit for dispatch. To each bottle is attached a tin box containing the sterilized equipment necessary for giving the blood. There are insulated boxes for the airplanes, each of which holds two crates and when loaded weighs about 100 pounds. The boxes are kept loaded in the refrigerator until just before dispatch. Thereupon a block of ice contained in a tin box is slipped into the lid of the box. This, in conjunction with the kapok insulating material with which the walls of the box are lined, ensures that the temperature inside the box will not rise more than 5 degrees C. in eight hours. Little structural change is required in the aircraft used for the work. The boxes are merely strapped to the fuselage to prevent rolling when in flight. The type of aircraft used can carry five boxes of blood; that is, 100 pints.

Treatment of War Fractures by the Closed Method

At the Royal Society of Medicine Dr. J. Trueta, late director of surgery at the General Hospital of Catalunya, Barcelona, described his method of treating war fractures, which gave good results in the Spanish civil war. Advance in the treatment of compound fractures had always been secured by the experience of war. He particularly discussed injuries from aerial bombs, which were more destructive than those from bullets. No measures against infection, such as antiseptics or serum, were used today without first excising damaged tissue. Contrary to the opinion held during the great war by surgeons, such as Leriche, he believed that the greatest danger of infection lay not in bone but in muscle, which was favorable soil for anaerobic infection. In extensive wounds of the limbs, Trueta observed clinically, perhaps for the first time on a large scale, that true shock is the result of absorption of disintegrating tissues. After air raids on Barcelona he operated radically on hundreds of persons with severe wounds of the limbs within half an hour and sometimes within twenty minutes. After treatment of the primary shock a meticulous operation was performed, all devitalized tissue being removed. When operation was undertaken immediately it was common to observe that secondary shock or generalized infections did not occur.

Movement increased the dissemination of infection in the body and rigorous immobilization prevented it. This could be obtained only by enclosing the limb in a rigid casing which prevented all movement and permitted good circulation. The only material which supplied this requisite was plaster of paris. Its only disadvantage was that it prevented examination of the wound, but this was seldom necessary. In the upper limb, if properly applied, the closed method was always satisfactory and gas gangrene and septicemia were very rare. In the lower limb the leg and the thigh must be separately considered. In fractures of the leg the circulation of the foot and the local circulation in the wounded part and the possibility of excising devitalized tissue must be carefully estimated. If, in spite of excision, there was still doubt about the vitality or the circulation, one should wait a day or two before putting on plaster, using open treatment with continuous traction. If amputation became necessary, it could then be performed without loss of

time. In the thigh the indications were the same, but the local circulation of the tissues surrounding the wound was more important than the general circulation of the leg, which was easier to assess. By this treatment many lives as well as limbs could be saved and gas gangrene disappeared from the hospital.

Reduction of fractures must be secured by traction on the operating table. The plaster of paris should then be applied under the anesthetic directly on the skin, without interposition of raw cotton or stockinet. Only the anterior-superior iliac spine, the os calcis and the achilles tendon required to be covered with cotton. The immediate benefits of the plaster treatment were absence of pain, rapid disappearance of shock and return of appetite. In 1,073 cases removal of the plaster for infection was necessary in only 0.75 per cent. The first plaster was retained for six weeks.

In calling for a discussion of the paper the president of the section of surgery, Mr. Cope, described it as momentous and bidding fair to revolutionize a most difficult war problem. There was general agreement as to the value of the paper, but one speaker called attention to what might seem a small disadvantage—the disagreeable smell due to saturation of the plaster with the discharges. Dr. Trueta replied that in a certain number of cases yeast obtained from breweries was applied and mitigated the smell.

The Surgical Treatment of Coronary Disease

At the Edinburgh Medico-Chirurgical Society Mr. Laurence O'Shaughnessy read a paper on the surgical treatment of coronary disease. In the cardiovascular clinic at the Lambeth Hospital of the London County Council he has performed twenty operations for cardiac revascularization. Fifteen of the patients suffered from angina pectoris. Of these five died: one on the table, another from uremia three months after the operation and three from heart failure two months after operation. All the survivors made such progress that those who were bedridden became active again and those unable to work resumed their employment. There were five patients with symptoms of cardiac ischemia other than angina and in this group no death was caused by the operation. O'Shaughnessy's operation consists of supplying a fresh source of blood for the defective cardiac circulation by transplanting a segment of omentum into the chest and grafting it to the heart (cardio-omentopexy). He first demonstrated that this was possible by experiments on greyhounds. He tied the left coronary artery, which impaired their racing powers. He later performed cardio-omentopexy on the ischemic heart and found that this restored their racing powers. He demonstrated vascular anastomosis between the omental graft and the coronary tree.

O'Shaughnessy showed that his operation imitates what may occur in disease. After coronary thrombosis in a small proportion of cases adhesions form between the infarct and the parietal pericardium. The beneficial association of pericarditis with coronary disease is illustrated by Sternberg's classic case of "pericarditis episternocardia" and Clifford Albutt's patient, a physician who returned to active practice after a severe attack of angina complicated by pericarditis. O'Shaughnessy observed the following similar case: A man now 67 suffered from severe angina. Three years ago he had a more violent attack than any previous one and was removed to the hospital in a state of collapse. For some days his state was critical but he recovered and after some weeks in bed returned home. He gradually resumed general activity and was amazed to find that his angina had disappeared. Moritz in 1932 demonstrated by injection studies the vascularity of pericardial adhesions. In the pathologic department of the Lambeth Hospital vascular continuity between the coronary tree and the vessels of the pericardium was found in a case of pericarditis following coronary thrombosis. Another example of disease pro-

ducing a collateral circulation is furnished by what sometimes happens in cases of uterine fibroids. When a pedunculated subserous fibroid suffers partial necrosis because the blood supply through a narrow pedicle is inadequate, the omentum adheres to the affected area and not only arrests the process but provides a local circulation adequate for the growth of the tumor, which may reach an enormous size. In cardio-omentopexy another benefit is possible: the graft (which is always attached in the region of the apex) may serve as a bridge between the right and left coronary vessels.

Good results from cardio-omentopexy are not to be expected when there is gross coronary disease with occlusion at several points. Hence O'Shaughnessy considers that a case in which two or more attacks of thrombosis have occurred is probably unsuitable for operation. In cases of calcification of the coronary arteries the results have been bad. Typical indications for the operation are presented by the patient who has made an incomplete recovery from a single attack of thrombosis, progressive angina of effort, hypertensive heart failure which has reacted badly to medical treatment, and syphilitic aortitis with aortic incompetence and anginal symptoms. The contraindications to operation are age, gross structural defects in the heart and vascular degeneration in the renal or cerebral vessels.

A British Standard for Hemoglobinometers

The British Standards Institution has circulated for comment a draft British standard specification for hemoglobinometers, based on the carboxyhemoglobin method of Haldane. As a result the institution has received requests that an acid hematin method, for example Sahli's, not involving the use of coal gas or carbon monoxide, should be standardized. Before deciding to proceed with this additional standardization the institution has circulated a memorandum to medical organizations and individual practitioners interested in the subject, asking for further information.

PARIS

(From Our Regular Correspondent)

Dec. 30, 1939.

Harvey Cushing

In the meeting of the Academy of Medicine Dec. 19, 1939, Professor Guillaïn pronounced a eulogy on Harvey Cushing, a member of the academy since 1929, paying tribute to the extraordinary personality of Cushing, possessing as it did the moral and intellectual qualities of a physician at his best. He recalled the fine medical heredity of the great clinician of Boston, his professional, scientific and fraternal relations with William Osler, his travels in Europe, where he made many distinguished friends, his eminent services in the World War, his contributions and his ability as a teacher. He was, according to Guillaïn, an unerring clinician, a philosopher, educator and inspirer. All who knew him felt his courtesy, his sympathy and his deep humility.

Prevention of Thrombopenia Due to Gold Salt Therapy

In *Le Sang*, organ of the French society of hematology, Prof. Knud Secher, of Copenhagen, discusses grave accidents due to gold therapy or sodium thiosulfate. Thrombopenias occur almost altogether in patients affected with rheumatism. Secher thinks these accidents are not due to metal intoxication but to a reaction provoked by toxins liberated in the course of the treatment. Febrile reaction which he traces solely to liberated toxins may be prevented by the administration of vitamins. The vitamin deficiencies affect the same organs which are affected by gold intoxication. Accordingly, by combating vitamin deficiency protection can be given against these accidents. A mixture of vitamin A (20,000 international units), B₁ (from 750 to 1,500 international units), B₂ (from 375 to 750 Krieger-Lassen units) and C (2,500 international units) enables

Secher to prescribe the gold salt therapy with high dosage for a large number of polyarthritic persons. He never observed a case of thrombopenia. A few exanthems that occurred during treatment were rapidly aborted by the administration of vitamin C, a substance that is markedly deficient in rheumatic and tuberculous patients.

Megakaryocytes and Sternberg's Cells

The frequent use of sternal puncture in the diagnosis of blood diseases led Gustavo Pittaluga at St. Anthony's Center of Blood Research to investigate the differences between Sternberg's ganglionic cells and the megakaryocytes that exist normally in the myeloid tissue. Medlar recently raised the question of the connection of Sternberg's cells with Hodgkin's disease. He found Sternberg cells in patients with Hodgkin's disease and thinks their origin is a systematic process of megakaryocytic metaplasia of the reticulo-endothelial system. Pittaluga does not share his view. He found essential differences in a study of 100 megakaryocytes and 100 Sternberg cells in the same person. The first have an average diameter of 46 microns and attain a maximal diameter of 90; the second measure from 32 to 70 microns. The relations of the nuclear mass to the cytoplasm, the chromatophilia of the cytoplasm, the structure of the mitochondria, the structure and chromatophilia of the nuclear chromatin are not the same. The nucleolar mass and the number of azurophil granulations indicate further contrasts. Besides, Sternberg's cells are not characterized by lymphogranulomatosis. Pittaluga concludes that no etiologic connection exists between the two diseases.

BUENOS AIRES

(From Our Regular Correspondent)

Dec. 30, 1939.

Isolation of Hypertensive Substance in the Blood

The kidney of animals with permanent arterial hypertension which was induced by constricting the renal artery pours into the blood a hypertensive substance (Houssay, Fasciolo and Taquini). If such a kidney is grafted in the neck of a normal dog by uniting the renal artery and vein of the kidney to the carotid and jugular vein respectively of the normal dog, the blood pressure increases in from five to fifteen minutes. If a normal kidney is grafted in the neck of a normal dog the blood pressure of the animal does not increase (Houssay and Fasciolo 1937). The citrated plasma of the venous blood of the ischemic kidney produces a strong vasoconstriction in the Laewen Trendelenburg toad preparation. Vasoconstriction is not caused when plasma of the venous blood of the normal kidney is used (Houssay and Taquini, 1938). To obtain greater concentration of vasoconstrictive substance in the blood, Braun Menéndez and Fasciolo used venous blood from a kidney which was supplied with blood from a cardiopulmonary preparation. In an hour of functioning, the defibrinated blood loses almost all its vasoconstrictive action. If by this time the supply of arterial blood is reduced by 80 or 90 per cent and after the reduction the venous blood from the kidney is collected, it can be shown that the hypertensive and vasoconstrictive action appears immediately in the blood. An injection of a small amount of blood is given to a chloralosed dog with the aim of desensitizing the animal against shocking substances. After an hour it is found that the blood from the ischemic kidney has a hypertensive action, if it is compared with that of the kidney which has an abundant blood supply from the circuit of irrigation (control blood). The authors, in collaboration with Leloir and Muñoz, found that the hypertensive substance of the blood serum dissolves itself when the serum is treated with three volumes of acetone. The evaporated residue elevates the arterial blood pressure of chloralosed dogs. The hypertensive substance is soluble in glacial acetic acid and resists boiling as well as acid hydrolysis. It dissolves neither in ether nor in amyl alcohol. The hypertensive

substance is differentiable from renin, which does not stand boiling and does not dissolve in 75 per cent acetone. It is also differentiable from epinephrine. Braun Menéndez and his collaborators found that when renin is incubated in blood serum from a normal dog, horse or ox for fifteen minutes a vasoconstrictive substance appears in the serum which is identical with that of the blood of the kidney with acute ischemia. The substance dissolves if three volumes of acetone are added to the blood serum. The substance resists boiling and acid hydrolysis. If renin and the blood serum are separately incubated and then mixed just prior to the aggregation of acetone to the mixture, the extract from the mixture is inactive. The hypertensive substance is called hypertensine. Work carried on by the Instituto de Fisiología of the Faculty of Medicine of Buenos Aires resulted in obtaining hypertensive substances, originating in the ischemic kidney, from the blood of dogs.

Cardiac Changes in Avitaminosis

Dr. Soldati reported to the Sociedad Argentina de Biología of Buenos Aires observations on disturbances of the heart in experimental avitaminosis B₁ in rats and dogs. Bradycardia which is not modified by administration of atropine or pitressin was found in avitaminosis B₁ in rats. In dogs there are tachycardia, hypotension and dilatation of the right side of the heart. The electrocardiogram shows an exaggerated P wave, unevenness of the QR waves and sometimes inversion of the T wave. There are interfascicular edema, perinuclear vacuolization and marked vacuolization of the system of conduction in all cases. The electrocardiogram of a dog indicated recent infarct. The animal was killed. There were two anemic infarcts, some small recent infarcts and remains of old infarcts. Obstructed vessels were not found in the zone of the anemic infarct, which probably was caused by functional disturbances of the myocardial supply, namely spasm, or compression by edema, in dogs with hypotension and with muscular fibers altered by the disturbance of nutritional deficiency. Dogs with avitaminosis B₁ react to intravenous administration of epinephrine with exaggerated hypertension and normally to acetylcholine hypotension. Pitressin produces bradycardia less acute in dogs with avitaminosis B₁ than in normal dogs. Stopping of the heart is obtained by stimulating the vagus nerve with the same acuteness as in control dogs.

Changes in Bones in Endemic Fluorosis

The presence of mottled enamel on the teeth of persons living in different regions of Argentina in which the amount of fluoride in drinking waters is abundant has been studied for years. Recently it was found that nine patients observed in Buenos Aires who came from the Pampas and other regions of the province of Buenos Aires had acute mottled enamel and skeletal alterations which varied from increased thickness of the lumbar and pelvic bones to generalized typical osteopetrosis. Drs. Capizzano, Paterson of Toledo, Megy and Valotta reported the condition in the *Revista de medicina y ciencias afines* (1, No. 4, 1939) and Mascheroni, Muñoz and Reussi reported an acute case to the Sociedad Argentina de Biología. The patient died from uremia. Fluoride (0.97 per cent) was found in the ashes of the bones.

Epidemic of Psittacosis

Outbreaks of psittacosis from parrots imported from Australia are frequently reported in Argentina. The first epidemic, well studied and in which a diagnosis was made, was reported by Barros in 1929. More than ten epidemics have been studied in the last ten years. The diagnosis has been made through the Instituto Bacteriológico del Departamento Nacional de Higiene, directed by Prof. Alfredo Sordelli. Recently an outbreak took place, with twenty-five patients and nine deaths. Three physicians were victims of the epidemic; one recovered and two died.

Personals

Dr. J. J. Spangenberg was appointed president of the Departamento Nacional de Higiene to fill the vacancy left by Dr. Miguel Sussini, who retired.

The following appointments were recently made: Prof. A. J. Costa for the chair of surgical technic of the Faculty of Medicine of Buenos Aires, left vacant by the death of Prof. Guillermo Bosch Arana, and Prof. E. Castaño for the chair of urologic clinic vacated by Dr. Bernardino Maraini, who retired at the age limit.

The following physicians left recently for the United States: Dr. Hugo Chiodi with a scholarship of the Rockefeller Foundation to carry on studies in the Fatigue Laboratory of Harvard. Dr. Flaminio Vidal with a scholarship of the Rockefeller Foundation to work on the subject of neurology under Dr. S. W. Ranson in Chicago. Dr. Eduardo de Robertis with a scholarship of the Fundación Devoto of the Academia Nacional de Medicina of Buenos Aires to study histology at Chicago University. Drs. Joaquin Llacer and J. Sozzi with the scholarship of the Asociación Argentina para el Progreso de las Ciencias to study microchemistry in the New York University. Dr. Armando Parodi with a scholarship of the Rockefeller Foundation to study viruses at the Rockefeller Institute of New York. Dr. C. Galli Mainini is to study nutritional diseases with Dr. E. P. Joslin, of Boston.

Visitors

The following professors visited recently the medical centers of Argentina and gave lectures: Profs. Roventine of New York (anesthesia), Gray Turner of London (surgery), G. Marañón of Madrid, G. G. Voronoff of Paris and George Harrop of Baltimore.

The following professors came to Argentina in exile: Professors Herlitzka of Turin, Foà of Milan, Lattes of Pavia and Morpurgo of Turin. They have neither official nor teaching positions.

Deaths

Dr. Enrique Bazterrica, an academic member, honorary professor and ex-dean of the Facultad de Ciencias Médicas of Buenos Aires and founder of modern gynecologic surgery of Argentina, aged 78, is dead.

Dr. Francisco Lobet, ex-assistant professor of anatomy and surgical medicine of the Facultad de Ciencias Médicas of Buenos Aires, aged 66, died of myocardial infarction. His collection of paintings is one of the richest in South America.

Dr. Bernardino Maraini, head of the department of urology of the Rawson Hospital and retired professor of the chair of clinical urology of the Faculty of Medicine of Buenos Aires died of myocardial infarction.

Dr. J. Salleras Pagés, assistant professor of clinical urology and head of the department of urology of the T. de Alvear Hospital, aged 52, is dead.

Marriages

ELLSWORTH H. TANNEYHILL, Chicago, to Miss Eleanor Meyer, of Mount Olive, Ill., in November 1939.

JAMES ELLIOT WALKER, Hopkinsville, Ky., to Miss Pertice Tucker, of Camp Hill, Ala., Dec. 26, 1939.

JESSE BLEASE FLOYD, Great Falls, S. C., to Miss Margaret Lewis Yongue, of Pickens, Dec. 24, 1939.

WOODROW B. ESTES, Williamsburg, Ky., to Miss Lucy Manley, of Akron, Ohio, Dec. 27, 1939.

PEARL A. TOIVONEN, Ontonagon, Mich., to Erkki Leppo, of Finland, at Detroit, Oct. 13, 1939.

EDWARD ALEX HEISE, Columbia, S. C., to Miss Imogene Hort Posey in December 1939.

CHARLES P. ROPER to Miss Cira Elizabeth Inman, both of York, S. C., Nov. 7, 1939.

Deaths

George Emerson Brewer, New York; University of Buffalo School of Medicine, 1884; Harvard Medical School, Boston, 1885; member of the Medical Society of the State of New York and the American Association of Genito-Urinary Surgeons; member and first president of the American Surgical Association and the Society of Clinical Surgeons; fellow of the American College of Surgeons; assistant demonstrator of anatomy from 1892 to 1900, instructor of surgery from 1900 to 1903, clinical lecturer, 1903-1904, professor of clinical surgery from 1904 to 1913, professor of surgery from 1913 to 1917 and since 1917 emeritus professor at the Columbia University College of Physicians and Surgeons; during the World War was director of a base hospital in France and was later consulting surgeon to the Forty-Second Division of the American Expeditionary Force; consulting surgeon to the Presbyterian, Roosevelt, Woman's, City and St. Vincent's hospitals and the Manhattan Eye and Ear Infirmary; was consultant to the Perth Amboy (N. J.) Hospital and the Muhlenberg Hospital, Plainfield; author of a "Textbook on Surgery for Practitioners and Students" published in three editions, and "Method of Surgical Diagnosis"; aged 78; died, Dec. 24, 1939, in the Harkness Pavilion of Columbia-Presbyterian Medical Center.

Henry Barton Jacobs • Baltimore; Harvard Medical School, Boston, 1887; associate in medicine at Johns Hopkins University School of Medicine, 1896-1904; original secretary from 1904 to 1920 and member of the original board of directors of the National Association for the Study and Prevention of Tuberculosis, now the National Tuberculosis Association; past president of the Maryland Tuberculosis Association and the Laennec Society for the Study of Tuberculosis; was a trustee of the Peabody Institute, Johns Hopkins Hospital, the Harriet Lane Home for Invalid Children, the Maryland Institute, the Children's Hospital School and the Church Home and Infirmary; past president of the Hospital for Consumptives, Towson; was a member of the original board of managers of the Maryland State Tuberculosis Sanatorium; associate editor of the *Annals of Medical History*; aged 81; died, Dec. 18, 1939, of coronary occlusion.

Howard Edwin Ruggles • San Francisco; Harvard Medical School, Boston, 1913; associate clinical professor of roentgenology from 1918 to 1927 and clinical professor since 1927, University of California Medical School; roentgenologist to St. Luke's Hospital and University of California Hospital; consulting roentgenologist to the Southern Pacific Hospital, Children's Hospital, Shriner's Hospital and San Francisco Hospital; member of the American Roentgen Ray Society; served during the World War; author, with Dr. George W. Holmes, of "Roentgen Interpretation," published in 1918, and "Urological Roentgenology," with Dr. Miley B. Wesson, published in 1936; aged 53; died, Dec. 29, 1939, of coronary sclerosis.

George Waller Hawley, Westport, Conn.; Cornell University Medical College, New York, 1899; member of the Connecticut State Medical Society and the New England Surgical Society; fellow of the American College of Surgeons; served during the World War; associate professor of surgery at the New York Post-Graduate Medical School, New York, from 1921 to 1928; attending surgeon to the Bridgeport Hospital from 1909 to 1934 and St. Vincent's Hospital, Bridgeport, from 1910 to 1917; assistant surgeon, Hospital for Ruptured and Crippled, New York, from 1908 to 1921; aged 65; died, January 1.

Robert Parke Bay • Baltimore; University of Maryland School of Medicine, Baltimore, 1905; professor of oral surgery at his alma mater; fellow of the American College of Surgeons; past president of the Baltimore City Medical Society; chief surgeon to the Maryland General Hospital; attending surgeon to the Church Home and Infirmary; consulting surgeon to the South Baltimore General Hospital, Union Hospital of Cecil County, Elkton, and the Harford Memorial Hospital, Havre de Grace; chief medical examiner of the State Industrial Accident Commission; aged 55; died, January 1, of cerebral hemorrhage.

Edwin Lucien Perkins, Sioux Falls, S. D.; Northwestern University Medical School, Chicago, 1904; member of the South Dakota State Medical Association and the American Urological Association; fellow of the American College of

Surgeons; past president of the Sioux Valley Medical Association; served during the World War; lecturer in obstetrics at the University of South Dakota School of Medical Sciences, Vermilion; formerly physician to the state penitentiary; aged 69; on the staff of the McKennan Hospital, where he died, Dec. 10, 1939, of cerebral hemorrhage.

John Henry Mullin, Wilmington, Del.; Johns Hopkins University School of Medicine, Baltimore, 1916; member and secretary of the Medical Society of Delaware; fellow of the American College of Surgeons; past president of the New Castle County Medical Society; served during the World War; served on the staff of the Delaware Hospital in various capacities, on the courtesy staff of the Homeopathic, Wilmington General and St. Francis hospitals; aged 50; died, Dec. 20, 1939.

Charles Falkowsky Jr. • Scranton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; member of the House of Delegates of the American Medical Association, 1936, 1938 and 1939; past president of the Medical Society of the State of Pennsylvania; fellow of the American College of Physicians; on the staffs of the Nanticoke (Pa.) State Hospital, Scranton State Hospital and the Mercy Hospital; aged 59; died, Dec. 28, 1939, of chronic myocarditis.

Dolph D. McHenry • Oklahoma City, Okla.; University Medical College of Kansas City, Mo., 1897; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of the Wesley Hospital, Oklahoma City Hospital and St. Anthony's Hospital; aged 66; died, Dec. 28, 1939, at St. Anthony's Hospital, St. Petersburg, Fla., of coronary thrombosis.

Harry Clifton Burgess, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1905; associate professor of obstetrics and gynecology at his alma mater; member of the American Gynecological Society; fellow of the American College of Surgeons; served during the World War; on the staffs of the Royal Victoria Hospital and Montreal Maternity Hospital; aged 56; died, January 1.

William Colegrove Tuckerman, Cleveland; University of Wooster Medical Department, Cleveland, 1905; member of the Ohio State Medical Association and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; aged 61; on the staff of the Glenville Hospital, where he died, Dec. 5, 1939, as the result of injuries received in an automobile accident July 30.

Theron Sparhawk Langford, Ann Arbor, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; member of the Michigan State Medical Society; past president and secretary of the Washtenaw County Medical Society; served during the World War; formerly member of the city board of health; aged 67; died, Dec. 20, 1939, in the University Hospital of coronary thrombosis.

Harry Locke Paddon, North West River, Labrador; L.R.C.P., London, and M.R.C.S., England, 1911; a medical missionary for many years associated with the work of Sir Wilfred Grenfell in Labrador; head of the hospital school and industrial work of the Grenfell Foundation at North West River, and Indian Harbor, Newfoundland; aged 58; died, Dec. 24, 1939, in the Bryn Mawr (Pa.) Hospital.

Joseph Numa Roussel • New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1896; formerly professor of dermatology at the Louisiana State University Medical Center; for many years dermatologist in charge of the Touro Infirmary, and senior visiting physician, division of dermatology, Charity Hospital; aged 68; died, Dec. 15, 1939, of angina pectoris.

Oren Mechling Kramer, Millersport, Ohio; Starling Medical College, Columbus, 1897; member of the Ohio State Medical Association; past president of the Fairfield County Medical Society; formerly physician to the state penitentiary; aged 66; died, Dec. 18, 1939, in the White Cross Hospital, Columbus, of coronary thrombosis.

Lee Humphrey, Malta, Ohio; Medical College of Ohio, Cincinnati, 1888; member of the Ohio State Medical Association; member and past president of the state medical board; and for many years member of the county school board and of the school board of Malta; bank president; aged 75; died, Dec. 30, 1939, of angina pectoris.

James H. Oakley • Surgeon, U. S. Public Health Service, Evansville, Ind.; Northwestern University Medical School, Chicago, 1891; entered the U. S. Public Health Service as an assistant surgeon March 21, 1893; and retired Nov. 1, 1929; aged 70; died, Dec. 21, 1939, of hypertension and cerebral hemorrhage.

Heber E. Butts * Surg., Lieut. Commander, U. S. Navy, retired, San Diego, Calif.; George Washington University School of Medicine, Washington, D. C., 1904; entered the navy in 1906 and retired July 1, 1937, for incapacity resulting from an incident of service; aged 62; died, Nov. 9, 1939.

Siegel Charles Frankel * Louisville, Ky.; University of Louisville Medical Department, 1906; associate clinical professor of medicine at his alma mater; on the staffs of the Louisville City Hospital, Jewish Hospital and the Kosair Hospital; aged 59; died, Dec. 27, 1939, of arteriosclerosis.

Simon Peter Schroeder, Nashville, Ill.; Hospital College of Medicine, Louisville, Ky., 1887; member of the Illinois State Medical Society; formerly secretary of the Washington County Medical Society; at one time county coroner; aged 78; died, Dec. 24, 1939, of coronary thrombosis.

George Marquet Phillips, Eau Gallie, Fla.; College of Physicians and Surgeons, Baltimore, 1887; at one time professor of genito-urinary surgery at the Barnes Medical College, St. Louis; aged 77; died, Dec. 25, 1939, in the Riverside Hospital, Jacksonville, of cerebral hemorrhage.

Henry Wise Lyon, Windsor, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1918; formerly county health officer, member of the county board of health and member of the school board; aged 49; died, Dec. 16, 1939, of chronic myocarditis and hypertension.

Victor Arthur Robertson * Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1883; fellow of the American College of Surgeons, consulting surgeon to the Coney Island and Harbor hospitals; aged 78; died, Dec. 21, 1939.

Leon Algernon Tancil * Chicago; Howard University College of Medicine, Washington, D. C., 1921; on the staffs of the Central Free Dispensary and the Provident Hospital; aged 49; died, Dec. 7, 1939, in the Presbyterian Hospital of amyotrophic lateral sclerosis.

Louis John Frederick Staack, Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895; aged 65; died, Dec. 25, 1939, in the New York Polyclinic Medical School and Hospital, New York, of coronary occlusion.

Roy Sumner Stearns, Portland, Ore.; Harvard Medical School, Boston, 1905; member of the Oregon State Medical Society; fellow of the American College of Surgeons; on the staff of the Portland Sanitarium; aged 62; died, Dec. 12, 1939, of coronary occlusion.

William Henry Steele, Montpelier, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; for many years member of the board of education; served during the World War; aged 66; died, Dec. 22, 1939, of coronary sclerosis.

Luther Throngberry Young, Florence, Ala.; Emory University School of Medicine, Atlanta, 1917; member of the Medical Association of the State of Alabama; served during the World War; aged 50; died, Dec. 26, 1939, of a self-inflicted bullet wound.

James Jett McCormick, Norfolk, Va.; University of Virginia Department of Medicine, Charlottesville, 1892; formerly city health officer; city bacteriologist and secretary of the board of health; aged 71; died, Dec. 21, 1939, of bronchiectasis.

George Lewis Johnson, Morristown, N. J.; Baltimore Medical College, 1901; member of the Medical Society of New Jersey; served during the World War; for many years police surgeon; aged 67; died, Dec. 12, 1939, of cerebral arteriosclerosis.

Nathaniel Robinson, Brooklyn; New York Homeopathic Medical College, 1885; fellow of the American College of Surgeons; attending surgeon to the Carson C. Peck Memorial Hospital; aged 78; died, Dec. 13, 1939, of cerebral hemorrhage.

Leonard Schreifels, Granite City, Ill.; St. Louis College of Physicians and Surgeons, 1899; member of the Illinois State Medical Society; past president of the Madison County Medical Society; aged 73; died, Dec. 27, 1939, of heart disease.

Warren G. Young, Port Arthur, Texas; University of Louisville (Ky.) Medical Department, 1891; member of the State Medical Association of Texas; aged 70; died, Dec. 12, 1939, in St. Mary's Hospital of coronary disease.

James T. Biggerstaff, Wabash, Ind. (licensed in Indiana in 1903); member of the Indiana State Medical Association; past president of the Wabash County Medical Society; aged 85; died in December 1939 of chronic myocarditis.

Frank A. Townsend, Orange, Mass.; University of the South Medical Department, Sewanee, Tenn., 1898; aged 70; died, Nov. 9, 1939, in the Franklin County Hospital, Greenfield, of cerebral hemorrhage and arteriosclerosis.

John E. Handy, Caro, Mich.; Detroit College of Medicine, 1887; member of the Michigan State Medical Society; formerly member of the state board of registration in medicine; aged 80; died, Dec. 1939, of chronic myocarditis.

Joseph Harrison Shelton * Kingsville, Texas; University of Virginia Department of Medicine, Charlottesville, 1905; fellow of the American College of Surgeons; aged 56; died, Dec. 23, 1939, of coronary thrombosis.

Detlef Marius Ferdinand Krogh, Philadelphia; Jefferson Medical College of Philadelphia, 1896; member of the Medical Society of the State of Pennsylvania; aged 72; died, Dec. 3, 1939, of arteriosclerotic heart disease.

James Perry Vickrey, Steele, Mo.; St. Louis College of Physicians and Surgeons, 1917; member of the Missouri State Medical Association; aged 55; was found dead, Dec. 17, 1939, of stab wounds inflicted by robbers.

Lewis Lowe Neblett, Clarksville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1901; member of the Tennessee State Medical Association; aged 73; died, Dec. 25, 1939, of coronary occlusion.

Emil Philip Wilhelm Richter * Saginaw, Mich.; Saginaw Valley Medical College, 1900; served during the World War; formerly county coroner; aged 64; died, Dec. 21, 1939, in the Saginaw General Hospital.

Arthur Asbra Shaw, Clinton, Maine; Medical School of Maine, Portland, 1891; member of the Maine Medical Association; aged 75; died, Dec. 15, 1939, in Concord, N. H., of carcinoma of the prostate.

James Cowan Storie, Ashburnham, Mass.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1884; aged 84; died, Nov. 1, 1939, of chronic myocarditis.

Charles Franklin Martin, Boonville, Ind.; Louisville (Ky.) and Hospital Medical College, 1908; member of the Indiana State Medical Association; aged 53; died, Dec. 18, 1939, of coronary occlusion.

Charles Bond Warner, Port Henry, N. Y.; Bellevue Hospital Medical College, New York, 1880; past president of the board of education; aged 85; died, Nov. 25, 1939, of influenza and myocarditis.

William Boyles Staples, Bladon Springs, Ala.; University of Nashville (Tenn.) Medical Department, 1896; aged 69; died, Dec. 13, 1939, in Mobile, of chronic nephritis and cerebral hemorrhage.

Edward Carson Abbott, Omaha; State University of Iowa College of Homeopathic Medicine, Iowa City, 1899; aged 63; died, Dec. 16, 1939, in the Lutheran Hospital of chronic myocarditis.

Eugene John Rooney, Chicago; University of Illinois College of Medicine, Chicago, 1927; served during the World War; aged 44; died, Dec. 29, 1939, of massive hemorrhage and duodenal ulcer.

George Swan Iddings, Euclid, Ohio; Cleveland Medical College, 1897; University of Wooster Medical Department, Cleveland, 1899; aged 88; died, Dec. 10, 1939, of arteriosclerosis.

Harry Thorne, Dayton, Ohio; Medical College of Ohio, Cincinnati, 1895; formerly member of the board of education; aged 66; died, Dec. 18, 1939, of chronic myocarditis.

Victor Clyde Laughlin, Lancaster, Calif.; Western Reserve University Medical Department, Cleveland, 1898; aged 66; died, Nov. 26, 1939, of coronary thrombosis.

Fred C. Cade, Chicago; Chicago Medical School, 1919; on the staff of the Provident Hospital; aged 53; died suddenly, Dec. 11, 1939, of coronary thrombosis.

Cora L. Emery Reed, Rock Island, Ill.; Hahnemann Medical College and Hospital, Chicago, 1884; aged 81; died, Dec. 3, 1939, of chronic myocarditis.

Harry Wilfrid Gaddess * Baltimore; Baltimore University School of Medicine, 1900; aged 60; died, Dec. 2, 1939, of cerebral hemorrhage.

Roswell Dwight Cruikshank, Goose Creek, Texas; Rush Medical College, Chicago, 1905; aged 63; died, Dec. 20, 1939, of cerebral hemorrhage.

Yves Lefebvre, Montreal, Que., Canada; University of Montreal Faculty of Medicine, Montreal, 1924; aged 41; died, Dec. 20, 1939.

Bureau of Investigation

NORMAN BAKER

Norman Baker, cancer quack of Muscatine, Iowa, and Eureka Springs, Ark., was found guilty on January 23, of using the United States mails to defraud. A few days later he was fined \$4,000 and sentenced to four years in the penitentiary. This 56 year old, white haired, nonmedical founder of the Baker Hospital has been the subject of numerous reports, both in these columns and in the editorial pages of *THE JOURNAL* and in *Hygia*, the health magazine. Now that he is for the first time quite incommunicado for a number of years, his history may be reviewed.

In a book called "The Throttle, A Fact Story of Norman Baker," by Alvin Winston, we find that "it took half a century of magnificent living on Norman Baker's part to make the story," and that the reader, when he finishes the story, is supposed to be inspired to write the following letter to his Congressman:

"Dear Sir: THE THROTTLE, A Fact Story of Norman Baker, charges that the radio trust did so and so; the medical monopoly, the American Medical Association, did so and so (fill in the details your own way); the aluminum trust and the rest did so and so. If this is untrue, send Norman Baker to jail. If it is true, send them to jail. I demand an investigation, at once. Or I'll vote for a man who will investigate. Sincerely,"

One Clement Wood wrote a foreword for this book, in which he stated:

"I admire Franklin Roosevelt so much, for his magnificent start in cleaning up the mess the Republicans had plunged us into, that I shall not nominate Baker for President until Roosevelt is through with the job. My slogan is, Norman Baker as Roosevelt's successor!"

Reference to the text indicates that Norman Baker was born in Muscatine, Iowa on Nov. 27, 1882, and was one of nine children of a family of German descent. It is clearly indicated in "The Throttle" that this is not a large city—"but it was the birthplace of Norman Baker; and Bethlehem is smaller yet."

Again according to "The Throttle," Baker received his education at the East Hill School and the Third Ward School and subsequently attended high school for a year and a half, at which time he apparently went to work in a machine shop. Later, according to the same source, he obtained a position which was offered to his brother in a button factory by claiming that the brushes on the motor were not properly adjusted. According to "The Throttle," "Now Norman Baker knew that there was nothing wrong with the brushes; but he was an instinctive salesman, and psychologist enough already to be sure that McDermott didn't know a brush from a pulley. He thought it would impress the potential employer. It did. The boy got the job."

"The Throttle" indicates that Baker believed in his own horoscope and the encouraging compliments which it paid to him. The author of "The Throttle" claims that "he once told me earnestly that he was sure that the moon, at least, had an effect on people; else why was it that, near the north pole, where the day is six months long, and the night as long, the women have only one menstrual period a year?"

A number of years later Baker was busy promoting a mind-reading act that was continually going broke, according to "The Throttle," which states that Baker cured himself of pneumonia with the mental determination to get well and a dish of ice cream. His principal in his "act" featuring "mental therapeutics" was known as Madame Tangley. Subsequent to this Baker is said by Winston to have invented and manufactured the "Calliaphone," which was promoted by the Tangley Company, Muscatine, Iowa. The instrument was subsequently heard nightly over XENT.

If one may believe "The Throttle," Baker at that time waged a successful war against the local power and light company at Muscatine, and his activities were supposed to have resulted in the development of a municipal plant which put the company out of business.

His Calliaphone activities were burned out one night, and he started an art correspondence school. Comments "The Throttle:" "It is no wonder that the American Medical Association publicly branded him as a Jack-of-all-trades; to the one-trade mind, such as that of a medical man, there is something suspicious about a man who can do everything, and everything well. No doubt Baker will proudly accept the charge, if to it is added the summary of what he did in all these trades: so that the indictment will then run, Norman Baker, Jack of all trades, and master of all."

About this time he was said to have some rather unusual ideas as to the treatment of shell shock. In the meantime he had reestablished the Calliaphone business on the profits obtained from the correspondence school course in art and began his activities in the radio field, which subsequently developed into Station KTNT at Muscatine. According to "The Throttle" he fought A. T. & T. and what he refers to as the "Radio Trust." His activities in the radio field led him into many other businesses. Because the crowds who attended the programs that were given over the radio complained of the food they obtained in Muscatine, he opened KTNT Cafe. Because they were unable to get gasoline, he opened KTNT Oil Station and, according to "The Throttle," successfully bucked Standard Oil. When the visitors to KTNT complained of blow-outs, he started the manufacture of a tire called The Tangley Pure Gum Rubber Tire, and "other products were added. A mail-order catalog was issued, which Baker still asserts contained more real bargains, more value for the money, than any catalog issued in the United States from that day to this."

He was also operating TNT Magazine Publishing Company, the Baker Press, which printed "The Throttle," and the Baker Cancer Hospital, in addition to the Tangley Correspondence Art School, the Baker Advertising Agency, the KTNT Chain Stores at Muscatine and Davenport, the Western Drug Company and the Mid-West Free Press, in addition, of course, to the Tangley Company, which manufactured the Calliaphone.

He was active in 1929 in the anti-aluminum ware campaign, and, if "The Throttle" can be believed, he first took up with cancer when he was "on the alert to find some matters of sensational public interest" and "at this time Baker, like most Americans, had been led by the pronouncements of the American Medical Association and their subsidiaries the State Boards of Health, to believe that cancer was one of the most dreaded of all diseases and was incurable." He became convinced that he had encountered a real cure and that if this could be proved, TNT would carry a story "Cancer Is Curable," if not, a story entitled "Cancer Doctor a Fake."

Apparently Baker had been previously connected with a varicose vein treatment and, with the inventor, Dr. Barewald, opened the Tangley Institute at Muscatine, Iowa, for the treatment of this condition. Subsequently, according to "The Throttle," he reviewed the evidence which became available as a result of his further investigations, and "the December 1929 issue of TNT . . . came out with an article revealing all these facts, headed by the proud title 'Cancer is Conquered.'" According to "The Throttle," he had arrived, from his painstaking tests, at the conclusion that "we quote from the December 1929 TNT—"the worst cases of cancer can be permanently cured. He challenges the world to investigate and disprove this broad and positive statement by the facts. All that he asks is open-minded investigation."

In "The Throttle" we find the statement: "Some said Baker was out for Governor; others, that he aspired to shoulder the Senatorial toga. Baker has no political ambitions . . ." And eight pages further along, in referring to some difficulty that Baker had encountered, it is stated: "There was only one good answer for it: for Baker to accept the proposition that had been made to him, that he run for Governor of Iowa, on the Farmer-Labor ticket." And a few sentences further along: "Next to the two major parties, Baker carried practically every county in Iowa." As nearly as can be determined, this sentence indicates that he ran third in those counties. According to the Associated Press, he was also subsequently a candidate for senator in Iowa in 1936.

One more reference to "The Throttle" is in order. Says the author: "If I were to have the power to dictate the future chapters of his life, I think I should head them:

Chapter XXVIII. License of KTNT Restored; Baker Operates the Two Greatest Stations in All Radio History.

Chapter XXIX. Dissolution of the A. M. A., as a Monopoly, after Government Investigation.

Chapter XXX. Dissolution of the Chain Radio Monopoly, and Appointment of Impartial Federal Radio Commission.

Chapter XXXI. Selling of Aluminumware for Kitchen Use Made a Federal Penitentiary Offense. Poisonous 'Purifying' of Water Forbidden Hereafter.

Chapter XXXII. Norman Baker Elected President of the United States, on Farmer-Labor Ticket. Perhaps of the United States and Mexico. But perhaps that is looking too far into the future. But Jim the canary is whistling his heart out, right over the immense hexagonal desk; and the sturdy little Napoleon is leaning over towards me earnestly, "Now, Alvin, the way this book ought to end, is—"

Now the license of KTNT has not been restored to date; the A. M. A. has not been dissolved; chain radio is neither a

ciation against the promotion of medical fraud. THE JOURNAL pointed out that the viciousness of Baker's broadcasting was not the lies he told about the American Medical Association but that he induced sufferers from cancer to resort to his nostrum in place of obtaining proper treatment.

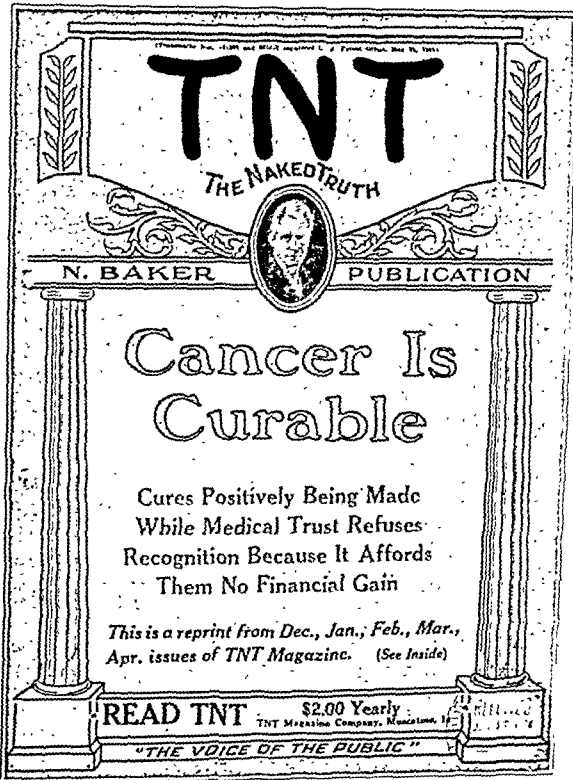
In the next issue of THE JOURNAL it was pointed out that the Des Moines Register had reprinted the previous article relative to Baker and had made an investigation of its own which established the utter falsehood of the claims made by him in his radio talks. The Register revealed many deaths from cancer among the Baker clientele and revealed the menace of Bakerism to be his vicious influence against modern scientific diagnosis and treatment and modern health work. Baker's reply was to state that he was being persecuted by the "Medical Trust," that he was benefiting 25 per cent of cancer, and that the Des Moines Register was "cowardly, contemptible and dirty."

That same year record was obtained of an individual who had been told at the Baker Institute that he had cancer of the chin and who stated that the Baker Institute "asked \$250 for the cure and \$240 to \$360 hospital care; also they charged \$10 examination before they would look at me. At the university hospital they charged \$49.50 in all and I was there just twelve days!" His treatment at the hospital referred to (University of Iowa College of Medicine) was entirely successful. Incidentally, the patient's condition was not cancer of the chin but what is commonly known as "barbers' itch."

The following year the Bureau of Investigation published an article in THE JOURNAL entitled "Norman Baker's Radio Station KTNT." It was stated that Baker was suing the American Medical Association for half a million dollars for alleged libel. In the meantime Norman Baker had applied for renewal of his broadcasting license, but it was denied because Mr. Yost, Chief Examiner for the Federal Radio Commission, pointed out that Baker had failed to establish that a renewal of his license would be in the public interest, convenience or necessity, that in serving the public with radio programs the station had subordinated the interests of the listening public to the interests of the licensee, and that therefore the granting of the application for renewal would not serve the public interest, convenience or necessity and therefore recommended that renewal be denied. Subsequently an extension was obtained by Baker, but he was definitely ordered off the air by June 5, 1931.

The case of Norman Baker versus the American Medical Association, after some four weeks of court proceedings, resulted in a verdict for the Association. Evidence was introduced in the trial justifying the statements on which libel was charged. At that time THE JOURNAL pointed out that "the evidence brought forth arouses pity for the situation that can permit the poor, the sick and the ignorant to be exploited. Justification by the courts of the condemnation given by THE JOURNAL to such exploitation repays but in small measure those who have suffered. The only answer that charlatanism can make to the publication of facts is a suit for libel. In its efforts to protect the public, THE JOURNAL and the American Medical Association have not been rarely compelled to respond to such suits. Fortunately, the Association is able to answer adequately. The appreciation of the medical profession and of the public is tendered to all those who have cooperated to bring to a successful issue the case of Norman Baker versus the American Medical Association." The following issue of THE JOURNAL carried a five page report of this case.

Later the same year THE JOURNAL published an editorial entitled "Voices Across the Rio Grande," which referred to the John R. Brinkley radio station, XER, and stated that it was anticipated that Baker would also operate from across the river. In a report on "Dr. J. L. Statler and Norman Baker" published by the Bureau of Investigation in THE JOURNAL for July 31, 1937, it was noted that Baker was operating Station XENT at Nuevo Laredo, Mexico, and was again applying for the right to open a station in Muscatine. In the meantime Baker was operating hospitals at Muscatine and Laredo, Texas, subsequently moving the Laredo institution to Eureka Springs, Ark. Furthermore, the Federal Communications Commission decreed that the manufacture of reproductions in this country and their transportation to a foreign country for the purpose of



Greatly reduced reproduction of the cover of Norman Baker's Magazine TNT. In it, and in reprints of it, Baker declared that cancer had been conquered, and published details of alleged cures which investigation proved to be not cures but deaths.

monopoly nor has it been dissolved; the selling of aluminum ware is not a penitentiary offense, because aluminum ware is not poisonous, as Baker has stated it is; and Norman Baker is in jail with little likelihood of ever becoming president of either the United States or Mexico, let alone both. Incidentally, Baker was not released on bond, because the judge stated that if he were in Baker's shoes he would skip the country if he were out on bond, especially if he had as much financial interest in another country as Baker has in Mexico.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION first reported Baker's activities in the issue of April 12, 1930, under the title "Broadcasting Bunk." It was pointed out that over KTNT of Muscatine, Iowa, Baker was promoting the old Hoxsey "cancer cure," which was responsible for many deaths in Taylorville, Ill., a number of years before; that he was claiming that the American Medical Association had offered him a million dollars in order to force the remedy off the market, and that he was using much of the scandalous insinuation that proprietary manufacturers used back in 1905, when they first attempted to hinder the battle of the American Medical Asso-

being broadcast from a foreign station so that they were received consistently in the United States was a violation of the regulations of the Commission. This decision, however, was subsequently reversed.

On April 15, 1939, THE JOURNAL published an editorial concerning the use of Baker's "cancer cure" in New Zealand and stated that an investigating committee reported:

"We have no doubt that Baker's fluid is a powerful sclerotic agent and can cause great local destruction. Compared with surgical treatment, destruction by a sclerosing or caustic fluid seems like a reversal to the treatment of the Middle Ages, causing unnecessary mental distress, delayed healing and increased risk of septic infection. We have had no evidence whatever to show that Baker's fluid has any selective powers in the destruction of cancer cells."

Under the heading "Arkansas Medical News" in THE JOURNAL for Sept. 30, 1939, it was noted that "Norman Baker, who moved his 'cancer cure' business to Arkansas after being accused of quackery in Iowa [he was fined \$1,000 and sentenced

if they fail to issue you a card each year. They didn't do a dam thing to Stat did they and I bla-bla it over the radio and told them old Stat would go right along and practice in Iowa without your dam old card, didn't I tell them that—didn't he work all year—didn't he get his card. To hell with that dam bunch of rats, they don't bludd [bluff?] me one minute . . ."

The identity of the author is self evident. "Stat" is presumably J. L. Statler, M.D. Statler and R. A. Bellows, the superintendent of the Baker Hospital, were also sentenced in this case—Statler for one year and one day and Bellows for two years.

The defense offered twenty-seven witnesses in support of the contention that Norman Baker and four associates had acted in "good faith" in advertising cures for cancer and other diseases through the mails and over the radio. Several of the witnesses admitted on cross-examination that they had come to testify at the trial in response to telegrams sent them by Norman Baker at Little Rock. Others said they had had letters from the Baker Hospital. One individual told the court that he had volunteered

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Cancer Is Conquered

Article I

CANCER is conquered. The greatest discovery in medical science in years—a positive cure for cancer, that dread disease which has taken toll of millions of lives, caused thousands to com-



Photo No. 1

mit suicide and driven other thousands to insanity—has been revealed by an investigation conducted by Norman Baker, publisher of TNT magazine and owner of the Norman Baker Enterprises and radio station KNTT, who was assisted by a physician and member of his staff.

Seeing in believing, Mr. Baker and his fellow investigators have seen with their own eyes enormous and malignant cancers in advanced stages of growth rapidly yield to a new and painless treatment, soften and disappear. They selected the cancer cases themselves for observation after they had determined beyond any doubt that they were authentic cases of cancer. They have watched these true cases of cancer under treatment and have seen the cancers grow smaller and disappear.

Will Spread the Truth
As a result of these investigations, Mr. Baker is ready to announce to the world that a treatment has been found that permanently cures cancer.

The investigation has covered several months of painstaking observation of selected cases. It will be continued for sometime and results will be reported in TNT magazine. The results observed to date have thoroughly convinced Mr. Baker that cancer has been conquered. He has decided, in consequence, to place TNT magazine and radio station KNTT wholeheartedly and unreservedly behind a campaign to spread this truth throughout the world.

Importance of the Discovery

It is hardly necessary to explain the importance of this discovery. Cancer is one of the most painful, hideous and terrible diseases known to man. It is advancing at an alarming rate in its inroads on mankind. One person in every ten now has incipient or malignant cancer. Unless it is checked by medical science its rapid spread will make it the major disease menace to the human race. Statistics show that more than 100,000 persons die yearly of cancer. Science is engaged in a literal war of defense against it and is steadily losing ground. As a result, cancer has become one of the chief concerns of medical science. No disease claims more attention and causes more agonizing investigations. A positive and permanent cure has been found for this disease. A priceless blessing has been conferred on the human race. One of the greatest causes of human suffering will soon be removed and the hearts of millions will be gladdened.

The frightful nature of this disease is indicated by the pictures on this page. Photo No. 1 shows cancer of the face. The photograph was mutilated so that the patient's features would not be recognized. A cancerous growth like this ate its way from the outside into the mouth so that the patient is not able

to eat solid food and subsists on liquid food until the end comes. Photo No. 2 shows a cancerous breast, with one breast removed. This is the most prevalent form of cancer. Men will never realize the untold agony women suffer from it.

Photo No. 3 shows another cancerous breast. Here the cancer is spreading to the upper part of the shoulder and under the arm.

What Caused the Investigation

The investigation that revealed this great discovery was started by Mr. Baker after a number of seemingly miraculous cures of very severe cases of cancer had been brought to his attention. The physician who was effecting these remarkable cures had encountered determined opposition from his profession and was having a hard fight to retain his license. This situation appealed to Mr. Baker as demanding attention. Was a valuable truth about to be suppressed because it might disturb or upset established methods and an organized and entrenched interest? An im-



Photo No. 2

partial investigation ought to reveal the truth. Successful investigation would either estab-

lish the value of the alleged discovery and thereby confer a priceless blessing on humanity, or else it would expose the truth as a fake and the perpetrator as a charlatan, thus saving



Photo No. 3

ing numberless prospective victims from losing their money uselessly or to their physical injury. Added to these motives was Mr. Baker's motive as a publisher keenly on the lookout for a feature article.

Real Test Planned

The investigation was started without bias or prejudice either for or against the alleged cure, but solely for the purpose of revealing the truth. The first step was a visit with the physician who had the cancer formula. The interview impressed the investigators very much. Patients were seen in various stages of the treatment and the evidence they supplied as to the efficacy of the treatment was overwhelming. The formula was not only being applied to the cure of cancer, but to the cure of other diseases arising from bad nutritional conditions, such as diabetes, Bright's disease, tuberculosis, goiter, stomach ulcers, gall stones and rheumatism.

The physician gave the investigators many names and addresses of patients whom he stated had been cured for years and were now living without a trace of cancer. He asked the investigators to interview them. Acceptance of this offer was deferred for the time being in favor of a test that would be of a much more fundamental and convincing nature. The testimony alone of alleged former patients would not be conclusive, as testimonials are often obtained by payments or personal influence.

As the basis of the investigation, Mr. Baker proposed that he select five test patients for the treatment after it had been positively determined that they had cancer. The actual results obtained from the treatment of these selected patients would fairly gauge the value of the remedy. He proposed to obtain these patients by giving talk over his radio station, KNTT, in which he would call for volunteers for a test treatment for cancer. The selection was to be made, if possible, from patients coming from different parts of the country, showing cancer in different stages of growth, and in different parts of the body. In addition, Mr. Baker and his assistants would avail themselves of the offer to interview or write to patients said to have been cured years ago and who had not suffered the return of the cancers.

Five Patients Selected

This challenge was immediately accepted. A stipulated price was agreed upon for the test patients, and Mr. Baker agreed to pay the expenses of some of the patients. In the accompanying pictures are presented photographs of the test patients selected showing the cancerous growths. In the January issue of TNT pictures of cured patients together with complete

data will be presented. We will not publish the names and addresses of the patients as they do not wish undue publicity, but assure our readers that the original photographs, letters and affidavits connected with the investigation, and the identity of the patients, are a matter of record, and will be furnished any government or private institution, medical group or association desiring to investigate for the purpose of giving the truth to the public.

As a publisher, Mr. Baker does not desire credit for being the first to reveal this discovery to the world. He has, therefore, sent copies of this article to the press and has invited the newspapers to verify the facts claimed as a result of his investigation, or use all or any part of this article.

First Patient Treated

The first patient to respond to the radio call for the test treatment was a woman who lived 25 miles from Muscatine and was suffering from a very bad abdominal cancer. She had been treated by local physicians and the Medical College of the State University of Iowa for cancer. As a last resort, radium



Photo No. 4

was used. The result of these radium burns are shown in the photograph of this woman, marked Photo No. 4. This radium burn was about four inches long and when spread out was

Miniature reproduction of a double-page spread of the Baker article in his magazine TNT, telling the public that "Cancer Is Conquered."

to one day in the Muscatine county jail following his plea of guilty to an indictment charging him with practicing medicine without a license, surrendered to the United States marshal on a federal indictment charging him with using the mails to defraud." The conclusion of this case is referred to in the opening paragraph above. Others who have been associated with Baker for a number of years and who were indicted along with him will be the subject of an early article in these pages.

The trial was quite suggestive of the trial of Baker versus the American Medical Association and, needless to say, the testimony of the experts was very similar. Evidence was introduced to show that Baker had expected to make a million in a year's time, that he employed the word "suckers" in this connection, and that former employees testified that they had never seen any cancer cured. According to an Associated Press release from Little Rock, Ark., the following note was entered in evidence:

"Get a belly-full of courage and nerve and tell the first _____ to go to hell that tells you he will cancer [cancel?] your license. Never yet as any Dr. even been cancelled or revoked and what in hell do you care

to come to testify "to help Mr. Baker out." Needless to say, the evidence of these individuals was riddled and failed to stand up as adequate evidence of the usefulness of the procedures employed by Baker.

Baker's "experts" included Dr. E. M. Perdue and Dr. Charles Löffler. Both have been subjects of adverse reports by the Bureau of Investigation in these pages. Again and again the same names appear whenever charlatans are called to account in the courts. Is there not an old proverb about "Birds of a feather"? The government experts included Dr. Max Cutler of Chicago and Dr. Francis Carter Wood of New York City. They testified without remuneration and the public and medical profession owe them appreciation.

A few days after being found guilty, Baker was fined \$4,000 and sentenced to four years' incarceration. A motion for a new trial was denied.

Four thousand dollars isn't a lot of money for a Baker, and four years isn't an eternity, but it meets the situation for the present admirably. Most admirably!

Correspondence

PROTEST AGAINST COMMERCIAL EXPLOITATION OF A SCIENTIFIC CONTRIBUTION

To the Editor:—In my mail January 3 I received a form letter on the stationery of Sutliff & Case Company, Inc., of Peoria, Ill., a circular advertising "Thio-Cara Compound and Thiocyan-Tabs" and what purported to be a transcript of a ten minute address which I gave before the Inter-State Post Graduate Medical Association meeting held in the Palmer House, Chicago, Nov. 1, 1939, on the subject "Experiences with the Surgical Treatment of Hypertension."

On the same date, on the advice of the Bureau of Legal Medicine and Legislation of the American Medical Association, I wrote this company calling attention to the fact that it had used my name in connection with advertising its product without my knowledge or my consent. I informed the company that the further use of my name in that connection was forbidden and that it must stop such use immediately.

I also stated that the material which purported to be a stenographic report of my address before that meeting was not submitted by me to any of the officers of that association nor was any other paper submitted to them; that the material was never seen by me prior to January 3 and that it had never been corrected or approved by me; that the statement that ". . . we have obtained his material and are attaching same hereto; . . ." thus indicating thereby that it obtained that material from me, was entirely a false statement.

I have sent all of the correspondence involved to the Council on Pharmacy and Chemistry and the Bureau of Legal Medicine and Legislation of the American Medical Association, including the most recent demands by me on this company to send a letter of retraction dictated by me and signed by the president of Sutliff & Case Company, Inc., to each of the doctors previously circularized.

Perhaps you will decide that this type of action by a drug company, which is indefensible, should be called to the attention of other physicians and surgeons.

LOYAL DAVIS, M.D., Chicago.

VITAMIN DEFICIENCIES AND RESTORED FOODS

To the Editor:—The publication in THE JOURNAL, Dec. 9, 1939, by the Council on Foods of Dr. Cowgill's article on The Need for the Addition of Vitamin B₁ to Staple American Foods marks an important step in this field and deserves the attention of American physicians. While evidence of deficiency of this factor in the diets of the Western nations has been accumulating during the past ten years, a quite properly conservative attitude toward these claims has been maintained by the Council. In publishing this article the Council has evidently decided that the facts are now so well established as to warrant their presentation as authoritative, and that they are of such importance that the medical profession and the public should be made aware of them.

Chief among these facts are the following:

1. Changes in milling practice and in the consumption of cereal products during the past hundred years have reduced the vitamin B₁ content of "good" diets from over 1,000 international units daily to 500 units or less. The latter figure does not furnish a desirable margin of safety and for some individuals, and in certain conditions, is definitely suboptimal.

2. A large part of our population subsists regularly on diets well below the 500 unit level and definitely in the deficiency zone.

3. Clinical experience with supplementary vitamin B₁ administration confirms strikingly the thesis that many persons suffer from a chronic shortage of B₁.

4. It is desirable that means be found for augmenting the vitamin B₁ intake of the population as a whole.

Dr. Cowgill's able discussion of this situation leads him to conclude that "prosecution of a program for fostering addition of vitamin B₁ to staple American foods according to the principles discussed in the present report would be definitely in the interests of the public." It is at this point that his proposed program, that of adding thiamin to wheat flour and cereal products, calls for critical examination and discussion. The embryo of grain is a highly complex reservoir of materials required for the growth and development of the plant, comparable as such to egg yolk, and as little understood. Furthermore, our knowledge of the essential dietary factors is far from complete. It happens now to be known that loss of this part of the cereal entails a nutritionally significant loss of vitamin B₁ from the diet. One is not justified in assuming that it entails no other significant losses until our knowledge of nutrition is more advanced than it now is. To propose solving this problem by adding thiamin to the diet is to evade the very real possibility that this measure will not solve the whole problem but will rather delay the search for a better solution.

Until all the factors lost in milling are known and it is known that each of the others is adequately supplied by other foods, the logical solution of the problem presented is the restoration of the grain embryo itself to the diet.

How this is best to be done is a matter for discussion, but there can be no question as to its desirability. Modern technology should be able to find a way to produce whole grain flours with satisfactory keeping qualities, to develop more useful whole grain products and to educate the public to use them. There are stable preparations of cereal embryo on the market for supplementing the diet; while these may be economically beyond the reach of the poor, a wider use might reduce their cost to a level which would make them more generally available.

Cereal germ is cheap and plentiful. To discard it from our human food supply is nutritional wastage on a huge scale, and one is not justified in assuming that the addition of thiamin alone to the present food supply will compensate for its loss. How to get it back into the diet is a technical problem which should not be impossible of solution and it would seem to be a more desirable objective than that proposed by Dr. Cowgill.

HENRY E. MARKS, M.D., New York.

THE PLUMMER-VINSON SYNDROME

To the Editor:—The editorial entitled the "Plummer-Vinson Syndrome and Cancer" in the Nov. 11, 1939, issue gives an erroneous impression regarding the authors of the syndrome.

In collaboration with Drs. William A. Swalm and Chevalier L. Jackson I have pointed out (Syndrome of Hypochromic Anemia, Achlorhydria and Atrophic Gastritis, THE JOURNAL, July 10, 1937, p. 108) and Correlation of Clinical and Gastroscopic Findings in Chronic Gastritis (Rev. Gastroenterol. 3:19, 1936) that Patterson and Kelly previously described this syndrome. I referred to the fact that D. R. Patterson (Brit. J. Laryng., Rhin. & Otol. 34:285 [Aug.] 1919) and A. B. Kelly (ibid., p. 289) had separately analyzed and presented a detailed group study from their respective clinics.

I feel that it is only fair to credit the priority of Patterson and Kelly's work, since the "Patterson-Kelly" syndrome was described three years prior to that of Plummer and Vinson.

In our article in THE JOURNAL just cited we reviewed, as was done in your editorial, the possibility of cancerous development in this group, but in the course of from four to five years of observation this has not occurred in our series. Of course appropriate therapy may have been prophylactic. Time and further experience will tell.

LESTER M. MORRISON, M.D., Philadelphia.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

JACKETS AND EXTERNAL APPLICATIONS IN PNEUMONIA

To the Editor:—In seeing cases of pneumonia in consultation, it seems to be the rule to find the patient within a heavy cotton jacket and heavily smeared with camphorated oil or some mentholated product and not infrequently with "antiphlogistine." I should like to ask whether there is any scientific proof that any external applications are of definite value in pneumonia or even in pleurisy. If of value, is the value in pain relieving or in producing resolution of the pathologic process? I leave the psychic value of this out of the question. Is there any justification in continuing the use of the cotton jacket, so-called pneumonia jacket? On the other hand, are they not actually harmful if not uncomfortable to the patient?

M.D., Washington.

ANSWER.—Reliable and cautious physicians observe relief of pain in pneumonias after counterirritation applied in a number of different ways. Aside from relieving pain there is no scientific proof that any external applications are of definite value in pneumonia or pleurisy. Embrocations, counterirritation, external applications and "antiphlogistine" (cataplasm of kaolin) have no effect on resolution. Resolution reflects an immunologic process, and the immunity mechanism is unaffected by counterirritation. Ever since emphasis has been placed on the etiology and specific therapy of pneumonias, many of the older therapeutic procedures have lost significance. The use of the so-called pneumonia jacket has become passé; it serves no useful purpose and has been discarded in many large services where pneumonia is given special attention and where excellent low mortality rates are obtained without it. Pneumonia jackets and counterirritants are harmful if they incorrectly place therapeutic emphasis so that the physician loses sight of the immunity problem involved. They may be uncomfortable, are heavy for prostrated patients to lift and may interfere with physical examinations, and when they are removed the patient may become chilled. They may interfere with necessary loss of heat, preventing evaporation, the chief cooling process, so that the fever is increased.

UNUSUAL NEUROLOGIC SYMPTOM FROM PNEUMONIA

To the Editor:—A well developed boy of 12 contracted pneumonia of the right lower lobe two months ago. Examination of the sputum revealed the influenza bacillus, the streptococcus and the pneumococcus (which could not be typed). There were 8,500 white blood cells with about 85 per cent polymorphonuclear leukocytes. The temperature ranged from 104 to 105 F. About the second day of his illness the patient complained of pain in the left forearm and also of inability to flex the terminal phalanx of the left thumb. He was given sulfapyridine on the fifth day and his fever promptly subsided, although the rale redux continued for about three weeks. During his convalescence he complained of pain in the left arm and in both feet. He was able to walk only with difficulty. There was, however, no swelling at any time. The boy now has completely recovered, no longer has any pain and is attending school. However, the use of his left thumb has not returned. I have had him examined by a neurologist but nothing has been found. What did the boy have, and what can I do to restore the function of his thumb?

M.D., New York.

ANSWER.—The data concerning the pneumonia do not permit an etiologic diagnosis to be made but suggest the atypical form of pneumonia, not bacterial in origin, which was prevalent during the last year or two. The normal leukocyte count and the evidence of delayed resolution are characteristic of this disease. Its course was not influenced by sulfapyridine, and in the case described the subsidence of the fever may have been spontaneous, since the average course of this pneumonia lasted from four to five days.

Whatever kind of pneumonia the patient had, the complicating neurologic symptoms described are most unusual. The absence of swelling and of continued fever rules out multiple focal purulent arthritis. The symptoms were perhaps caused by multiple peripheral neuritis in spite of the fact that no other abnormal neurologic signs were found. In this event it is highly probable that the function of the thumb will gradually return to normal if, on electrical examination, no reaction of degeneration of the median nerve is found. Restoration may be hastened by massage, heat, exercise and stimulation with a faradic current.

EPINEPHRINE AND ELECTRIC SHOCK

To the Editor:—Is there any literature on contraindications to the use of epinephrine in the treatment of electric shock?

T. J. Cush, M.D., Johnstown, Pa.

ANSWER.—According to D. R. Hooker (*Am. J. Physiol.* 91:305 [Dec.] 1929) ventricular fibrillation is the common cause of death in electric shock; this is especially so in the low voltage shock from ordinary house currents. Epinephrine may also induce fatal ventricular fibrillation in conditions in which the heart is hyperirritable from the effects of poisons (benzene, chloroform). H. E. Hoff and L. H. Nahum (*J. Pharmacol. & Exper. Therap.* 52:235 [Nov.] 1934; *Am. J. Physiol.* 110:675 [Jan.] 1935) used acetyl-beta-methylcholine chloride for the prevention of ventricular fibrillation by electric shock and found that epinephrine counteracted the effect of the acetyl-beta-methylcholine chloride or in larger doses increased the possibility of fatal ventricular fibrillation. They also mentioned a case in which a man apparently recovered from the effects of a shock and then died when he got up to walk away. They suggested that this was due to the effect of an increased secretion of epinephrine on the heart. Hooker studied the effect of epinephrine in stopping fibrillation but that after the fibrillation had been stopped by other means epinephrine was of use in increasing the strength of contraction of the heart muscle.

While there has been no specific study of the effect of epinephrine on a heart stopped by an electric shock comparable to that causing heart failure in man, most experiments seem to contraindicate its use.

RECURRENT DISLOCATIONS OF SHOULDER

To the Editor:—A girl aged 20 who is in good health has had repeated anterior dislocations of the right humerus. The dislocations are easily reduced under light anesthesia. After the first accident her arm and shoulder were in a plaster cast for six weeks, but there have been four dislocations since. After each accident she wears her arm in a sling for about two weeks and then she considers herself recovered until the next time. She refuses surgical treatment and is anxious to know if there is any device she could wear that would act as a preventive against further dislocations. Any suggestions would be appreciated.

Herbert J. Schwartz, M.D., Challis, Ida.

ANSWER.—Recurrent dislocations of the shoulders are most satisfactory treated by one of two or three operative procedures, probably the most successful being that described by Nicola. No mechanical device which permits reasonable use of the arm can be entirely successful in preventing these dislocations. The most effective consists of a cuff about the arm at the level of the middle third of the humerus and a band or belt about the thorax just below the breasts. A light chain such as that worn on watches may then be attached to the band on the arm and, through a series of buttonhole openings in the clothing; to the chest strap in the axillary line. This chain should be just long enough to permit abduction of the elbow from the side for a distance of 8 inches, and forward flexion is then automatically limited.

This type of device has been reasonably successful, even when worn by football players, but it is more difficult to prevent redislocation of the true anterior type than if the weak spot in the capsule were more definitely inferiorly placed.

PREMENSTRUAL ASTHMA AND ENDOCRINES

To the Editor:—In *The Journal*, Oct. 21, 1939, page 1586, there is the statement, in answer to Dr. R. E. Shaw's query, "Every one agrees that many female asthmatic patients are worse just before the flow and feel better as soon as menstruation begins. Because of this, many physicians give injections or tablets of ovarian material." I fail to see why ovarian material should be given in such a case, since it is known that with the menstrual flow the estrogenic hormone in the blood diminishes abruptly. If at this point the asthmatic attacks improve, why should one inject estrogenic substance to stimulate the premenstrual state? This would be most illogical; as a matter of fact such injections are as a rule accompanied by aggravation of the asthma unless it has no relationship to the ovarian status.

William Wolf, M.D., New York.

ANSWER (This was referred to the consultant on whose answer Dr. Wolf comments).—From clinical experience there is no doubt at all that a good many female asthmatic patients in whom asthma is intensified before menstruation have been benefited by the administration of estrogenic preparations. There are also reports of good results from corpus luteum. It is difficult to defend this result from the theoretical point of view, but many who see considerable numbers of asthmatic patients will testify to the fact that after taking the ovarian extract the patients are able to go through subsequent menstruations with little or no asthma.

POSSIBLE CALCIFIED TUMOR OF CHOROID PLEXUS

To the Editor:—I should like information regarding the treatment for an enlarged and calcified choroid plexus of the left lateral ventricle in a woman aged 54. The diagnosis was made by a ventriculogram. This woman complains of excruciating pain in the left side of the head at frequent intervals, absolute insomnia and occasional spells of dizziness; she sees spangled lights at times and has double vision in the lateral gaze. The latter has been explained as a third and fourth nerve vascular lesion. The eyegrounds are normal with the exception of some mild sclerosis. The eye fields are normal. Blood count shows 14,000 white cells and 4,500,000 red cells. Differential count and blood smears are normal. There is no nausea, but there have been frequent periods of vomiting; this has not been characteristically projectile, but the food would well up into her mouth much like a regurgitation without warning. X-ray study of the gastrointestinal tract and gallbladder yields negative results. The urine is normal. The Wassermann reaction of the blood is negative. The electrocardiogram is normal. The basal metabolic rate is —22 per cent. The pulse is regular and within normal limits. The temperature is normal. The blood pressure is now 120 systolic and 70 diastolic but has been down to 104/64, and the patient has shown signs of orthostatic hypotension. There are no focal signs, but the woman has had spells characterized by generalized numbness of the body, flushing of the face, lasting only a few seconds, and incognizance of her environment, followed by precordial palpitation and diarrhea. Results of further neurologic examination are negative. Are there any similar cases reported? Can you refer me to the literature? How would you explain the leukocytosis? Can it be dehydration? What would be the procedure of treatment?

M.D., New York.

ANSWER.—It is only occasionally that calcified tumors of the choroid plexus cause trouble. Without seeing the ventriculograms, which of course are all important in diagnosis, one would feel that the burden of proof was on the diagnosis as stated. However, it is entirely possible. The history suggests a brain tumor near the midbrain or third ventricle. No explanation of the leukocytosis is apparent; it may or may not be relevant but is not due to dehydration. A series of tumors in this region was reported by W. E. Dandy (Benign, Encapsulated Tumors of the Lateral Ventricles of the Brain, Baltimore, Williams & Wilkins Company, 1934). The treatment is removal of the tumor, the exact localization of which can be made by ventriculography.

DAIRY PRODUCTS AFTER MEAT

To the Editor:—The Hebrew dietary laws, as prescribed in the Talmud, prohibit the ingestion of milk or other dairy products for at least six hours after eating meat; nor may meat be eaten together with milk. No reason or explanation is given for such an edict. It is assumed, however, by some authorities that such a prohibitive regulation was formulated as a purely sanitary and hygienic measure against certain gastrointestinal disturbances which might result from such a combination of foods when consumed in tropical climates. I shall appreciate information as to whether any research or experimental work has been done by scientific medicine along these lines and what the opinion of medical authorities is relative to the meat-milk problem.

M.D., Connecticut.

ANSWER.—There is no meat-milk problem although good sanitation and hygiene must be observed in the preparation and handling of meat and milk and, indeed, all foods. It is likely that early Hebrew dietary laws were formulated as sanitary measures, and a fairly complete discussion of this interesting topic is available in the following articles:

- Jewish Ceremonials and Food Customs, *J. Am. Dietet. A.* 4: 91 (Sept.) 1928.
Jewish Contributions to the Hygiene of the Digestive Tract, *M. J. & Rec.* 125: 49 (Jan.) 1927.
Jewish Dietary and Hygienic Laws, *Pub. Health J.* 14: 483 (Nov.) 1923.
Jewish Food Habits, *J. Am. Dietet. A.* 9: 389 (Jan.) 1934.
Historical and Biological Evolution of the Human Diet, *Am. J. Digest. Dis.* 1: 215 (May) 1934.

MAXILLARY SINUSITIS IN PREGNANCY

To the Editor:—A patient six months pregnant has had an acute attack of chronic maxillary sinusitis. Her face swells unilaterally, with slight pain. Constricting drugs on the mucous membrane evidently open the passage but little, if any, discharge results. Every few days she complains of a sore throat, which is injected on inspection. The problem is the choice of some type of vaccine, either stock or autogenous (which kept her free from attacks for about eighteen months), roentgen therapy or ultrashort wave diathermy. Are any of these procedures contraindicated in pregnancy?

M.D., New York.

ANSWER.—The history as given assumes that there has been nothing left undone to establish a diagnosis. Unilateral swelling of the face, while it may occur, is not common in maxillary sinusitis and it would require careful study and x-ray examination to make sure that there is no cyst or new growth present. The fact that constricting drugs do not shrink the mucous membrane should impel the examining physician to make sure by history, nasal smears, and other measures that there is no concomitant allergic condition present.

As to the choice of treatment, any one of the treatments mentioned can be used or all three of them without affecting the pregnant state. When these treatments are instituted, the physician should know that he uses them empirically and that while none of them are curative, or uniformly successful, palliation of symptoms is also a concern of the doctor and provides the justification for such treatment.

LACTATION AND MENSTRUATION

To the Editor:—Does menstruation in a nursing mother affect the baby? If so, in what ways?

L. A. Crowell, Jr., M.D., Lincoln, N. C.

ANSWER.—The breast milk of a nursing mother is said to be qualitatively unaltered during this period. Occasionally there is a lessened supply of breast milk during the menses, and the reaction on the baby may be one of hunger. The emotional factor and increased nervous tension which accompany the menstrual period in some women may be the cause of this diminution in quantity.

In the Middle Ages it was common practice to nurse the child until the first deciduous dentition was completed. Among many primitive races nursing at the breast is common until the child is of a considerable age. No difficulty arises from menstruation on the part of the mother. It is apparent therefore that menstruation per se has no direct effect on the breast milk or the infant, and it has never been recommended as a contra-indication to nursing.

PNEUMOCOCCIC ARTHRITIS OF HIP

To the Editor:—Kindly send me information regarding frequency, prognosis and treatment of pneumococcal infection of the hip following lobar pneumonia. I am especially interested to know the proper treatment in these cases.

Hilmar R. Schmidt, M.D., Petersburg, Va.

ANSWER.—Pneumococcal infections of the hip are rare, although a definite percentage incidence cannot be given. In one series of 1,800 cases of pneumonia, pneumococcal arthritis was observed as a complication in only two cases. The disease usually occurs in children, although it may occur in adults. Treatment in the past has been essentially conservative, aspiration being performed repeatedly if necessary and drainage instituted only when the condition seems to be getting out of control. In addition, the surgeon now has the advantage of the use of sulfanilamide and the drugs of that group, which have proved so successful in the treatment of pneumonia. Therefore it would seem best in the light of this knowledge to adhere even more closely to surgical conservative measures.

INHERITANCE OF LOOSE JOINTS

To the Editor:—Can you give me information with regard to the hereditary tendency and pathology of abnormally loose joints?

George C. Oldag, M.D., Paulina, Iowa.

ANSWER.—Congenital relaxation of joints, produced by over-long ligaments and other capsular structures permitting abnormal ranges of motion, appear to be simple recessive hereditary characteristics. In the recessive patterns the appearance of mild abnormal conditions, such as the one referred to, is not likely to be inherited by the children unless the marriage is between cousins.

MALINER'S TEST

To the Editor:—In the December 9, 1939 issue of The Journal on page 2171, M.D., Illinois, asks for information regarding Maliner's test. The reply unfortunately, to my belief, was misleading, and I wish to correct it. The article by W. F. Matthews and myself in the Archives of Pediatrics 56: 142 (March) 1939 was merely a corroboration of work done by Master with a few modifications. This test has never to my knowledge been personalized. However, the term "Maliner's test" has frequently been attached to work done by me on the use of epinephrine 1:1,000 as a means of accentuating organic precordial murmurs. This was first reported in the Archives of Pediatrics 49: 305 (May) 1932 and later by Maliner and Okin in the Journal of Pediatrics 10: 77 (Jan.) 1937.

Martin M. Maliner, M.D., Brooklyn.

VISUAL DISTURBANCES AND SULFANILAMIDE

To the Editor:—With regard to the query of Dr. Manfred Landsberg in The Journal, Dec. 16, 1939, page 2260, I have seen a patient whose refraction became 6 diopters more myopic following a small dose of sulfanilamide. There was almost total obliteration of the anterior chamber of both eyes. I was unable to determine whether this was due to swelling or forward displacement of the lenses because in my fear that a glaucoma might develop I had used physostigmine to constrict the pupil. In three days the eyes had returned to normal.

Ray W. Hughes, M.D., Detroit.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, February 3, page 433.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, Feb. 12-14; Part III, June or July, to be given in medical centers having five or more candidates desiring to take the examination. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Oral. Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. If a sufficient number of applications are received before March 1 there will be an examination at New York, June 10-14. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathologic examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 7-10. Applications for admission to Group A, Part II, examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Oral. New York, June 8-10; Cleveland, Oct. 5. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Kansas City, Mo., May 18, following the Region III meeting of the American Academy of Pediatrics. Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Cincinnati, May 17-18. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: New York, June 7-10. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., Rochester, Minn.

Texas November Examination

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports the written examination held at Austin, Nov. 20-22, 1939. The examination covered twelve subjects and included 120 questions. Eighteen candidates were examined, fourteen of whom passed and four failed. Fifty-four physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine.....	(1934)		86.5
Harvard Medical School.....	(1939)		84.8
University of Michigan Medical School.....	(1935)		83.4
Meharry Medical College.....	(1937)		76
Medizinische Fakultät der Universität Wien.....	(1925)		79.8
Christian-Albrechts-Universität Medizinische Fakultät, Kiel.....	(1934)		78.2
Hamburgisch-Schlesische-Fakultät, Breslau.....	(1936)		77.8
Vereinigten-Friedrichs-Universität Medizinische Fakultät, Halle-Wittenberg.....	(1926)		75
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia.....	(1937)		79.5
Osteopaths *.....	75.7, 78.6, 79.2,		83.3
School	FAILED	Year Grad.	Per Cent
Japan Medical College, Hongo.....	(1910)		64.5
Universidad Nacional Facultad de Medicina, Mexico.....	(1928)		72.5,
(1937) 62.3			
Osteopath *.....			70

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Physicians and Surgeons, Little Rock.....	(1911)		Arkansas
University of Arkansas School of Medicine.....	(1937)		Arkansas
College of Medical Evangelists.....	(1931), (1935)		California,
(1938) Tennessee, (1939) North Carolina			
University of Colorado School of Medicine.....	(1932)		Colorado
Yale University School of Medicine.....	(1899)		Connecticut,
(1932) Michigan			
Howard University College of Medicine.....	(1937)		Tennessee
Emory University School of Medicine.....	(1939)		Georgia
Northwestern University School of Medicine.....	(1933)		Minnesota
University of Illinois College of Medicine.....	(1937)		Illinois
State University of Iowa College of Medicine.....	(1936)		Iowa
University of Kansas School of Medicine.....	(1936)		Kansas
Flint Medical College of New Orleans.....	(1939)		Arkansas
Louisiana State University Medical College.....	(1939)		Louisiana
Tulane University of Louisiana School of Medicine.....	(1934)		Minnesota,
(1935), (1937), (1938, 3) Louisiana			
Johns Hopkins University School of Medicine.....	(1936)		New York

Harvard Medical School.....	(1928)	Illinois, (1936)	New York
University of Minnesota Medical School.....	(1938), (1939)		Minnesota
St. Louis University School of Medicine.....	(1939)		Missouri
Washington University School of Medicine.....	(1935), (1938)		Missouri
Creighton University School of Medicine.....	(1933)		Kansas,
(1937) Ohio			
Omaha Medical College.....	(1900)		Nebraska
Syracuse University College of Medicine.....	(1914)		New York
Ohio State University College of Medicine.....	(1921)		Ohio
University of Cincinnati College of Medicine.....	(1935)		Ohio
University of Oklahoma School of Medicine.....	(1935)		Oklahoma
Jefferson Medical College of Philadelphia.....	(1928)		New Mexico
University of Pennsylvania School of Medicine.....	(1925)		Mississippi,
(1936) Minnesota			
College of Physicians and Surgeons, Memphis.....	(1910)		Arkansas
Meharry Medical College.....	(1928)	Mississippi, (1937)	Tennessee
Sewanee Medical College.....	(1900)		Louisiana
University of Tennessee College of Medicine.....	(1936, 2)		Tennessee,
(1937) Louisiana			
University of Wisconsin Medical School.....	(1935)		Wisconsin
University of Bristol Faculty of Medicine.....	(1934)		New Jersey

* Examined in medicine and surgery.

Georgia October Examination

Mr. R. C. Coleman, secretary, Georgia State Board of Medical Examiners, reports the written examination held at Atlanta, Oct. 10-11, 1939. The examination covered ten subjects and included 100 questions. An average of 80 per cent was required to pass. Twelve candidates were examined, all of whom passed. Eleven physicians were licensed by reciprocity and five physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Sciences.....	" "	" "	83.2, 86.2
Emory University School of Medicine.....	" "	(1939)	84.1
University of Georgia.....	" "	(1939)	83.8
The School of Medicine of the Division of Biological Sciences.....		(1936)	82.6
Tulane University of Louisiana School of Medicine.....		(1939)	81.1,
81.6, 86.4, 91.6			
Harvard Medical School.....		(1938)	86.7
Creighton University School of Medicine.....		(1936)	81.7

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine.....	" "	" "	Penna.
Emory University School of Medicine.....	" "	" "	N. Carolina
University of Louisville School of Medicine.....	" "	" "	Kentucky
Tulane University of Louisiana.....	" "	" "	" "
(1935) Louisiana, (1934) Alabama			
Hahnemann Medical College and Hospital of Philadelphia.....		(1937)	New Jersey
University of Tennessee College of Medicine.....		(1923)	Alabama,
(1937) Tennessee			
Vanderbilt University School of Medicine.....		(1915), (1933)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Howard University College of Medicine.....		(1932)	N. B. M. Ex.
Northwestern University Medical School.....		(1933)	N. B. M. Ex.
Cornell University Medical College.....		(1933)	N. B. M. Ex.
Duke University School of Medicine.....		(1937)	N. B. M. Ex.
University of Pennsylvania School of Medicine.....		(1933)	N. B. M. Ex.

* These applicants completed four years' medical work and will receive an M.D. degree on completion of internship.

Arkansas November Examination

Dr. D. L. Owens, secretary, State Medical Board of the Arkansas Medical Society, reports the written examination held at Little Rock, Nov. 9-10, 1939. The examination covered twelve subjects. An average of 75 per cent was required to pass. Two candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine.....		(1939)	87.1
The School of Medicine of the Division of Biological Sciences.....		(1939)	90

Seven physicians were licensed by reciprocity and one physician was licensed by endorsement from July 25 through December 26. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....		(1930)	Mississippi
University of Georgia Medical Department.....		(1924)	New York
State University of Iowa College of Medicine.....		(1933), (1936)	Iowa
Jefferson Medical College of Philadelphia.....		(1922)	Missouri
University of Tennessee College of Medicine.....		(1937)	Tennessee
Meharry Medical College.....		(1931)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Meharry Medical College.....		(1931)	N. B. M. Ex.

Book Notices

Sterility and Impaired Fertility: Pathogenesis, Diagnosis and Treatment. By Cedric Lane-Roberts, M.S., F.R.C.S., F.R.C.O.G., Gynecological Surgeon, Royal Northern Hospital, London, Albert Sharman, M.D., M.R.C.O.G., Assistant Surgeon, Royal Samaritan Hospital for Women, Glasgow, Kenneth Walker, F.R.C.S., Surgeon to the Genito-Urinary Department, Royal Northern Hospital, London, and B. P. Wiesner, D.Sc., Ph.D., F.R.S.E., Consulting Biologist, Royal Northern Hospital, London. With a foreword by The Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P. Cloth. Price, \$5.50. Pp. 419, with 90 illustrations. New York: Paul B. Hoeber, Inc., 1939.

The field of sterility has become so extensive that it now requires a group of workers to deal adequately with all its various aspects. This condition is fulfilled in the present volume, which is the joint production of two gynecologists, a urologist and a biologist, each well known for his valuable contributions to the subject. Their book is complete and authoritative. It discusses thoroughly the modern views on the causation of infertility, with a critical analysis of the supporting evidence. Every recognized method of diagnosis and treatment receives attention. In some instances the weighting of these items does not accord with their practical importance; for example, while operations to remedy tubal occlusion are fully described, there is only the briefest mention of the surgical treatment of polycystic ovaries. The sections on endocrinology present an admirable summary of newer developments in that department of medicine, including not only theory but also practical application to problems of reproductive failure. The technic and interpretation of both endometrial and testicular biopsies are clearly explained. A good half of the total subject matter concerns itself with the male partner; in this is included a consideration of his responsibility in cases of habitual miscarriage. Throughout the book the authors maintain a commendable attitude of caution in their conclusions and of conservatism in their recommendations. The numerous illustrations are well chosen and beautifully executed. A series of appendixes dealing chiefly with technical laboratory procedures, a sufficient bibliography and a good working index complete the volume. The main feature of this book is its wealth of scientific detail, and one is led to wonder whether that very virtue may not overwhelm the ordinary practitioner who seeks primarily simple guidance in clinical procedure. The specialist, on the other hand, will welcome a treatise which is the last word to date on normal and abnormal human reproductive physiology.

Symposium on the Synapse. By Herbert S. Gasser and others. Reprinted from *Journal of Neurophysiology*, 1939, 2. Paper. Price, \$1.50. Pp. 361-474, with 25 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, Publisher, 1939.

This classic of neurophysiology represents the present conceptions of synaptic conduction. It is invaluable and should be carefully studied. Gasser considers the axon as a sample of nervous tissue and qualitatively, therefore, as casting light on the physiology of synapse. This is achieved through the experimental demonstration of subnormal excitability in the axon as well as other parts of the neuron following single spikes or trains of spikes. This phenomenon renders the later discussion of inhibition and facilitation more understandable.

Erlanger then considers the question of differences between nerve fiber and synapse conduction. With the aid of information obtained by stimulation and polarization of the axon and studying such phenomena as latency, one way transmission, repetition, temporal summation, facilitation, and transmission of the action potential across a nonconducting gap, he is able to demonstrate "a temporal relation between subthreshold effect of a shock applied to a fiber, the subthreshold effect of an action potential beyond a block at a node and the subthreshold effect of an action potential blocked at a neuromuscular junction by curare." On the evidence presented he feels that transmission of the impulse across a synapse depends entirely on the influence exerted by the potential difference on the excitability and does not depend on substances released at the nerve ending.

Bronk passes from analogous behavior studies of axons to the study of sympathetic ganglions as samples of synaptic mechanisms. He attempts to correlate the electrical characteristics with the interesting excitatory effects of acetylcholine and potassium ions on the postganglionic fibers of sympathetic ganglions.

While it is not desired to make a definite statement on the basis of available evidence, a definite scheme favors the dualistic theory of excitation at the synapse. His primary thesis, based on both the electrical and the chemical evidence, is that of a dynamic synapse undergoing a continuous change of state modified by numerous factors.

De No, by virtue of a detailed and ingenious study of the internuncial neurons lying between sensory nerves and motor nuclei of the medulla, and also by the method of electrical stimulation and pick-up and by a modification of the experiments of Wedensky, tends to an essentially electrical interpretation of conduction at the synapse. He says that "the action currents of nerve impulses arriving at the synapses may prove not to be the agents for synaptic transmission but everything happens as if they were." The cocaine nerve block experiment of Wedensky is enlarged, studied in detail and set up as a model of synaptic transmission with possibilities as fascinating as those of the iron wire model of Lillie.

Forbes completes the monograph with a summary of the more recent developments of the humoral aspect of synaptic transmission and emphasizes the great number of unanswered questions about the relative importance of each of the factors demonstrably concerned in the physiology of the synapse. Chemical versus electrical excitation at the synapse is still not a solved problem.

L'électro-encéphalogramme, normal et pathologique. Par Ivan Bertrand, directeur à l'Ecole des hautes études, Jean Delay, médecin des hôpitaux de Paris, et Jacqueline Guillemin, assistante à l'Institut de neurobiologie. Paper. Price, 50 francs. Pp. 293, with 94 illustrations. Paris: Masson & Cie, 1939.

In this first monograph on the electro-encephalogram an attempt is made to cover all aspects of the clinical phases of the subject. A historical chapter includes the demonstration of electric currents in animal brains by Caton in 1875 as well as the subsequent contributions made in Germany, England and America, the literature being briefly reviewed. This is followed by a technical discussion of the principles of amplification and recording adapted at once to the purposes of the biologist setting up a laboratory and to those of the general reader.

The physical character of the alpha rhythm is discussed, brief attention being paid to its origin as argued by Adrian and by Berger. The physical characteristics of the beta rhythm, less well known, are given corresponding cursory treatment. Mention of delta waves completes the formal description. The phylogenetic differences in rhythms, the development of the regular ten per second adult rhythm from the slow irregular patterns of infancy, individual differences, modes of classification and criteria of "normal" are completely represented.

Normal and pathologic types of sensory activity are presented in visual, auditory, cutaneous, gustatory, olfactory and proprioceptive studies of the animal brain. The studies of the effects of visual, auditory and tactile stimuli on the alpha rhythm of man, while completely represented, indicate the infancy of this phase of the subject. Pathologic conditions such as hemianopia, hallucinations induced by mescaline and hypnosis, and finally a differential test for hysterical anesthetics are presented.

Included under considerations of normal and pathologic psychic activity as represented in the electro-encephalogram is a discussion of the accepted "stages of normal sleep." The differential effect of the anesthetic gases and barbiturate sedation on the cortical rhythm during the induction of sleep is striking in that the barbiturates induce a more "normal" type of sleep waves. Comas and torpors of various sorts are attended by slow delta waves. Narcolepsy and prolonged hypnosis are attended, on the other hand, by diminution of the alpha rhythm. That the phenomena appearing in sleep may be duplicated by cortical differentiation is demonstrated by Bremer's experiments with the "isolated brain" technic.

Psychiatric considerations concern mental retardation, wherein only idiocy is characterized by slow irregular patterns while imbecility and mental defect have more nearly normal patterns. Myxedema and dementia paralytica are given detailed description, and finally the inconstant features of schizophrenia and their modification by insulin and metrazol therapy in the direction of enhancing the usually weak alpha rhythm are discussed.

Normal and pathologic motor activity include correlations of frequency of finger tremor and precentral rhythms and differentiation of occipital and precentral alphas. Some consideration is given to the rapid cerebellar rhythm and to cerebellocerebral relationships. The well established patterns of grand and petit mal and the current American concept of epilepsy as a paroxysmal cerebral dysrhythmia are well presented. The inconstant features of parkinsonism are less well known and are presented as an open problem.

Included in the section on localizing the value of the electroencephalogram is a discussion of correlations of precentral betas and occipital alphas with their respective sensory representations in cutaneous and visual spheres. The sharp correlation of electrical fields with cyto-architectonic ones in the animal and the more diffuse nature of this phenomenon in man are shown. Instruction in the use of the instrument for localization of cortical lesions such as tumors is amply given by the use of case material.

Two final chapters on experimental alteration of the cortical rhythms by ischemia, asphyxia, chemicals, pH change differentiation by the Bremer technic and considerations of the general question of neuronal automatism and synchrony conclude this readable summary of the subject of clinical electro-encephalography.

Treatment of Some Common Diseases (Medical and Surgical). By Various Authors. Edited by T. Rowland Hill, M.D., M.R.C.P., Physician to the Southend General Hospital, London. Cloth. Price, \$5. Pp. 398, with 90 illustrations. Baltimore: William Wood & Company, 1939.

The twenty-one authors of this book are not perhaps among those British practitioners whose names are best known in American medical circles nor is the Southend General Hospital of which they are staff members particularly famed on our side of the Atlantic; it is therefore quite enjoyable to welcome from this group and hospital a pleasing little book. The twenty-six subjects covered seem, to be sure, to have been chosen quite at random, as though each man had simply elected to write on a topic in which he was much interested, but the style is on the whole quite pleasing and the book certainly fulfils the editor's wish that it be looked on merely as a small volume to be taken down and read from time to time by practitioner and student.

The subjects included are angina pectoris, heart failure, pleurisy, bronchopulmonary suppuration, anemia, cerebral vascular disease, digestive disorders of infancy and childhood, prophylactic treatment by active immunization, malignant disease of the pharynx, obstructive jaundice due to malignant disease, hemorrhage from the intestinal tract, enlargement of the prostate gland, infections of the face and neck, suppurative lesions about the knee joint, head injury and its complications, uterine hemorrhage, delay in labor, shock during anesthesia, preanesthetic medication, x-rays in the treatment of malignant disease, injuries to the skin and mucous membrane in radiation therapy, moles, warts and angiomas, ocular complications of some common disorders of the skin, carache, dental caries and postoperative wound complications. There are numerous good photographic reproductions both of x-ray films and of facies, a number of line drawings and charts, and several color plates. The index seems adequate but there is no bibliography, which is perhaps not a serious omission in this type of book.

Eye, Ear, Nose and Throat Manual for Nurses. By Roy H. Parkinson, M.D., F.A.C.S., Head Oculist and Aurist to St. Joseph's Hospital, San Francisco, California. Fourth edition. Cloth. Price, \$2.25. Pp. 243, with 79 illustrations. St. Louis: C. V. Mosby Company, 1939.

In a competent fashion the author discusses the anatomy of the eye, ear, nose and throat. He devotes a great deal of attention to the common diseases of these regions. At the end of the various chapters are questions relating to the material covered. The proper knowledge of the answers presumably would mean that the student nurse had a good understanding of the various details discussed in the text. There follows then the discussion of the care and treatment of eye, ear, nose and throat conditions and finally the technic of assisting the surgeon in these regions. This part is particularly valuable. Reproductions of photographs show the instruments which are used, which should be of great value to supervisors and senior nurses as well as informative for the younger group. In the hands of those who devote time to the teaching of nurses a manual of this character should be of great value.

Klinische Chemie und Mikroskopie: Ausgewählte Untersuchungsmethoden für das medizinisch-chemische Laboratorium. Von Dr. Lothar Hallmann, Direktor der biochemischen und bakteriologischen Abteilung des städtischen Kaiser-Friedrich- und Kaiserin-Friedrich-Kinderkrankenhauses in Berlin. Paper. Price, 12 marks. Pp. 387, with 113 illustrations. Leipzig: Georg Thieme, 1939.

This is an excellent little book on clinical chemistry and microscopy. It is divided into three parts: general laboratory technics, qualitative, physical and general investigations, and quantitative micro methods. Introductory remarks relate to the handling of glassware, weighing, making the solutions, reagents and bacterial stains. This part is well done. The first chapter deals with investigation of sputum, stomach contents and duodenal juices. The second chapter relates to general investigations of intestinal contents, chemical and microscopic. There are fifteen pages on parasites and protozoa. The third chapter deals with details of sputum analysis. The fourth chapter discusses exudates, transudates and cyst fluids. This is only two and a half pages and necessarily is exceedingly brief. The fifth chapter relates to investigations of urine and covers ninety-one pages. It is abreast of the time but rather superficial. The sixth chapter discusses spinal fluid, sixteen pages in all. It gives details of the Heller, Weichbrodt, Nonne-Apelt, Pawlowitsch, Pandy and Lange tests, the mastic reaction, the normomastic reaction of Kafka, the lumbootest of Emanuel, a quantitative albumin test of Kafka, the Takata-Ara reaction, the tryptophan reaction of Voisiniet, the chemical test for sugar, the hemolysin test of Weil and Kafka and the vitamin C test. The method for counting cells is that utilizing the well known Fuchs-Rosenthal counting chamber and the Jensen counting chamber. The seventh chapter discusses blood; this consists of 187 pages and is a good chapter. The eighth chapter discusses quantitative chemical investigations of body fluids, which are mostly micro methods. This is a valuable brief or outline of clinical chemical procedures. To use a continental expression, it is a good vade mecum. There is an excellent table of medicochemical terms and a table devoted to the appearances in various diseases. So far as references to the literature are concerned, there is a table of references to the literature of blood chemistry covering six printed pages. It is noteworthy that among these references there are but twenty references to American articles, which is a typical German method of ignoring our literature.

British Health Resorts, Spa, Seaside, Inland, Including Those of the British Dominions and Colonies. With Chapters on the Science of Waters and Baths, the Climates of the Coast and the "Invalids" Winter. Edited for the Association by R. Fortescue Fox, M.D., F.R.C.P., F.R.Met.S. Assisted by Wyndham E. B. Lloyd, M.R.C.S., L.R.C.P., D.P.H. With a foreword by the Rt. Hon. Walter Elliot, Minister of Health. Official Handbook of the British Health Resorts Association. Paper. Price, 2s. 6d. Pp. 317, with illustrations. London: The Association, 1939.

In the foreword the minister of health stresses the importance of health resorts in the national fitness campaign. He points out that the recent extension of holidays with pay makes the health resorts of inestimable value. The chapters on the scientific basis of medical practice at the spas and the coast have been rewritten. Also the analysis of the regional climates has been amplified with new data. The editor has presented a simple classification of mineral waters and has agreeably omitted all claims for the specificity of any particular water for any particular condition. He points out the fact that the selection of the proper spa for treatment depends to a considerable degree on the constitution of the patient as well as on his particular disease. This emphasizes again the important fact that spa therapy is effective through its influence on disordered bodily function rather than being a specific for the disease. In the report of the medical advisory committee, the concise and clearly stated work and place of spas in promoting and maintaining health and preventing disease is emphasized. The ministry of health is urged to act in this field by inspection and recognition of the spas. The section on spas provides condensed information for the physician which has been approved by the medical advisory committee of the association regarding location, climate, the waters, the treatments, the indications and entertainment features. A notable omission is information regarding the physicians in practice at each spa. Information regarding living accommodations is provided in a separate section made up of the advertisements of the various hotels. The importance of studying the factors of climate such as pressure, temperature, wind, light, humidity, sunshine, precipitation and electricity as

they influence or produce the bracing tonic or relaxing sedative climate is clearly emphasized. The section of seaside resorts of the British Isles lists information regarding their location, climate, sea bathing, indications and attractions. Their hotels are listed in the special section.

Obstetrical Manikin Practice. By Lyle G. McNelle, M.D., Professor of Obstetrics and Gynecology, University of Southern California School of Medicine, Los Angeles. Cloth. Price, \$2. Pp. 111, with 38 illustrations. Baltimore: William Wood & Company, 1939.

This little manual is well done and serves to replace the use of the larger textbooks in the manikin classroom. The book amounts to an outline of operative obstetrics and as such should prove valuable to the student, advanced or beginning. The only objection that can be raised to this volume is that it can be considered inadequately illustrated. Such a book has long been needed as an addition to the American literature, and McNelle has made an excellent beginning. No doubt the needed revisions will be made in future editions. This book can be recommended to the serious student of obstetrics.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Copyright: Excerpt from Medical Book Used for Commercial Purposes.—One of the plaintiffs, referred to by the court as the "use-plaintiff," was the author of a book on the human voice which was copyrighted by the publishers. After the publication of the book, the defendant tobacco company published and widely circulated a pamphlet entitled "Some Facts About Cigarettes," in which under the heading "Do cigarettes affect the throat?" appeared quotations attributed to the author and which in fact were copied, although not exactly, from matter appearing in the book on the human voice. The publishers of the book, "to the use of" the author, filed a complaint in the United States district court, eastern district, Pennsylvania, against the defendant tobacco company, charging copyright infringement.

The complaint averred that the use of the excerpt from the book in advertising matter of the nature under consideration cast reflections on the professional ethics of the author and brought down on him the term "commercialist," all of which contributed to negative and deter the sale of the book. The complaint further alleged that the defendant had realized large profits and advantages from the infringement and that it was prepared to continue the acts complained of, unless restrained. The defendant moved to dismiss the bill, urging that the copied matter was negligible in quantity, that its literary or scientific content was insignificant and that the copying did not exceed a fair use of a scientific treatise, due acknowledgment having been made to the author.

In order to constitute an infringement of the copyright of a book, said the court, it is not necessary that the whole or even a large portion of the book shall have been copied. Furthermore, the reproduction need not be literal and exact; it is piracy if it appears that the copyrighted work has been copied, although altered or paraphrased. The three sentences from the book that were used by the defendant, while constituting but a small part of the book, represented those portions of it which were pertinent to the subject of the defendant's pamphlet. Furthermore, the matter that was reproduced from the book constituted about one twentieth of the pamphlet. Under these circumstances, the court could not say that the matter used by the defendant was so unsubstantial as to afford no remedy.

The fact that the defendant acknowledged the source from which the matter was taken did not excuse the infringement. While the acknowledgment indicated that the company did not intend unfair competition, it did not relieve the defendant from legal liability for the infringement.

The infringement complained of was not excusable on the ground that the defendant was making no more than a fair use of the author's work. It is true that the law permits those working in a field of science or art to make use of ideas, opinions

or theories, and in certain cases even the exact words contained in a copyrighted book in that field. This is permitted in order "that the world may not be deprived of improvements, nor the progress of the arts be retarded." In such cases, the law implies the consent of the copyright owner to a fair use of his publication for the advancement of the science or art. This principle, however, had no application in this case. The pamphlet was a publication not in the field in which the author wrote, nor was it a scientific treatise or a work designed to advance human knowledge; it was intended to advance the sale of the defendant's product, a purely commercial purpose, and there arose no implication that the author consented to the use of his work for such a purpose.

Finally, the defendant urged that the action was improperly brought in the name of the publishers "to the use of" the author. In the opinion of the court, this point was well taken, for there is no such thing as "suing to the use" in equity. Here, the author of the book for whose benefit the publishers acquired a copyright was entitled to maintain the suit in equity in his own name. The improper joinder of the publishers as plaintiff was, however, the court said, amendable, and the plaintiffs were accorded leave to amend the bill by eliminating the publishers as a party plaintiff. Counsel for the plaintiffs also requested leave to amend the bill so as to introduce a cause of action arising out of the alleged violation of the author's right of privacy by the defendant's pamphlet. Without passing on the question whether or not such a right exists, the court found difficulty in understanding how the copying of a book which the author had published to the public could be held to be an invasion of his privacy. Such a right, however, the court pointed out, if it existed, involved an entirely new and essentially different cause of action based on an entirely different ground of jurisdiction. This new cause of action, the court said, could not be introduced into the present copyright action under the guise of an amendment to the complaint.

The court, therefore, refused the motion to dismiss the bill of complaint on condition that the bill be amended by eliminating the publishers as a party plaintiff.—*Henry Holt & Co., Inc., to Use of Felderman v. Liggett & Myers Tobacco Co. (Pa.), 23 F. Supp. 302.*

Workmen's Compensation Acts: Lead Poisoning as Accidental Injury.—The principle issue involved in this case was whether the death of the employee from lead poisoning resulted from accidental injuries received within the scope of his employment, and hence compensable under the workmen's compensation act of Texas, or whether the lead poisoning constituted an occupational disease for which no compensation was provided by the act. The district court granted compensation, after having charged the jury that an occupational disease is one acquired in the usual and ordinary course of an employment, which disease, from common experience, is recognized to be incidental thereto and is the usual and ordinary result incident to the pursuit of an occupation and must, in the nature of things, be the result of a slow and gradual development. The insurer appealed to the court of civil appeals of Texas, Galveston.

For more than five years prior to his death the employee had been employed by an iron and steel company where he was exposed to fumes and poisonous gases arising from melted lead. On May 15, 1936, the employee inhaled an unusually large quantity of poisonous lead fumes. On the morning of that day he appeared for work in an apparently normal and healthy condition. His helper testified that the masks furnished by the company to protect employees from the lead fumes were old and were not effective and that at the time the employee became ill the fumes were so bad that he coughed and choked and complained that he could not stand the fumes any longer. The employee became gradually worse and died May 30. The family physician of the employee testified that on several occasions in March 1936 he treated the employee for lead colic and that he treated him again on May 20 for acute lead poisoning and that the cause of the death was acute lead poisoning. This testimony, the court said, showed that at a definite time and place the employee was subjected to an unusual volume of poisonous lead fumes which might have been prevented by furnishing to the employees of the company masks which would have protected them against the fumes. In view of the definition of an occu-²

tional disease given to the jury by the trial court, which the appellate court inferentially approved, it was the opinion of the latter court that the employee died from accidental injuries, not from an occupational disease.

The employer contended that the trial court erred in refusing to instruct the jury to find whether or not the employee's death was due to an accident. In the case of *Associated Indemnity Corporation v. Baker*, 76 S. W. (2d) 153, a similar contention was made and the court said:

This was not error. It was shown that the injuries received on that day were the result of inhaling poisonous fumes and gases from the condenser. It was further shown that no other employee in the performance of the same duty had suffered any injury prior to that time. A finding that his injuries were the result of inhaling the fumes is tantamount to a finding that they were the result of an accident.

The judgment of the trial court in the present case, awarding compensation, was affirmed.—*Casualty Underwriters v. Flores (Texas)*, 125 S. W. (2d) 371.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, Louisville, Ky., Mar. 20-22. Dr. E. R. Clark, Dept. of Anatomy, Univ. of Pennsylvania School of Medicine, Philadelphia, Secretary.

American Association of Pathologists and Bacteriologists, Pittsburgh, Mar. 21-22. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.

American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.

American Orthopsychiatric Association, Boston, Feb. 22-24. Dr. Norvelle C. La Mar, 149 East 73d St., New York, Secretary.

American Physiological Society, New Orleans, March 13-16. Dr. Philip Bard, Johns Hopkins Medical School, Baltimore, Secretary.

American Society for Experimental Pathology, New Orleans, March 13-16. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.

American Society for Pharmacology and Experimental Therapeutics, New Orleans, March 13-16. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 12-13. Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary.

Federation of American Societies for Experimental Biology, New Orleans, Mar. 13-16. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.

Mid-South Post-Graduate Medical Assembly, Memphis, Tenn., Feb. 13-16. Dr. A. F. Cooper, Goodwyn Institute Bldg., Memphis, Tenn., Secretary.

Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glen Bell, University of California Hospital, San Francisco, Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH

Twelfth Annual Meeting, Held in Chicago, Nov. 3 and 4, 1939

(Continued from page 440)

Influence of Various Substances (Including Lipocaic and Choline) on Fatty Livers Produced by Scorbuto-genic Diets

DRS. M. A. SPELLBERG and R. W. KEETON, Chicago: Twenty-five of twenty-seven guinea pigs rendered scorbutic by the Sherman-LaMer-Campbell scorbuto-genic diet showed morphologic evidence of moderate to severe fatty degeneration of the liver. Five of these livers, analyzed for total lipids by the Van Slyke monometric method, contained between 11 and 26 per cent of fat. When this diet was enriched by the addition of dextrose and desiccated yeast, the analysis of the livers of six animals showed a fat content of from 4.5 to 12.5 per cent. The normal livers had a fat content of about 2 per cent. That the lack of ascorbic acid is not the sole responsible factor of the pathologic change in the liver was proved by the additional experiment giving adequate amounts of this vitamin to the diets described (ten animals). In the animals on this regimen also fatty livers developed, containing up to 33 per cent of fat. Death was frequently precipitated by a pulmonary infection. Orange juice was no more effective in preventing these fatty livers than pure ascorbic acid, but the animals receiving the fruit juice as a supplement seemed to survive somewhat longer. The only animal that survived more than five months showed cirrhosis of the liver on postmortem examinations.

The lipotropic effect of choline and lipocaic were tested on ten animals. The choline was given as the hydrochloride, 20 mg. daily to each animal. The dose of lipocaic was about 475 mg. daily. Both of these doses are considered adequate for exerting a lipotropic effect. Neither of these substances produced a significant reduction in liver fat. The animals receiving lipocaic showed a liver lipid content of from 9 to 22 per cent, while those on choline showed from 7 to 20 per cent of fat. These values are not significantly below those of the controls.

In addition to adding another approach to the study of liver pathology our experiments suggest that the absence of an unknown or little understood substance in these diets is responsible for these liver changes and that this type of fatty liver is influenced by neither choline nor lipocaic.

DISCUSSION

DR. LESTER R. DRAGSTEDT, Chicago: The gross and microscopic appearance of the liver in the experiments of Drs. Spellberg and Keeton resemble closely the fatty infiltration in the liver which occurs in the depancreatized dog treated with insulin. This latter type of fatty infiltration can be prevented or cured by the oral administration of adequate amounts of fresh pancreas or lipocaic. We have tested the fraction of lipocaic used by Dr. Spellberg and found it to be effective in relieving fatty infiltration of the liver in the depancreatized dog in a dose of from 2 to 2.5 Gm. of dry substance daily. Accordingly it would seem that the smaller amount given by Dr. Spellman should be effective in a guinea pig. We are not sure, however, that the dosage of lipocaic bears a direct relation to the body weight, and for this reason I should like to see the authors repeat the experiment with larger amounts of lipocaic. Whatever may be found with respect to the relation of lipocaic to this type of fatty infiltration in the liver, the observation does not affect the status of lipocaic as an internal secretion of the pancreas. I should like to emphasize this because in the early part of our work some criticism was voiced on the basis of experiments performed on a type of dietary fatty liver produced in normal rats. I will summarize briefly the evidence which makes us believe that lipocaic is a specific internal secretion of the pancreas. 1. The depancreatized dog fed on a mixed diet of protein, carbohydrate and fat is not restored to a normal state by the adequate administration of insulin but exhibits a specific type of disturbance in fat metabolism and commonly dies within three or four months with extensive fatty infiltration of the liver. 2. This disturbance in fat utilization is corrected by the oral administration of pancreas. 3. The beneficial effect of pancreas in this connection is not due to its content of pancreatic enzymes, since fresh active pancreatic juice was found to have no such beneficial effect. 4. The beneficial effect of pancreas cannot be accounted for on the basis of its content of lecithin and choline, since liver and brain, which contain these substances in even greater amounts, exhibit no such beneficial effect. Furthermore, the amount of choline required to produce an equivalent beneficial effect in the depancreatized dog is approximately ten times as great as the amount of choline present in an adequate dose of pancreas. 5. When extracts of pancreas are prepared, the fraction soluble in ether, which contains the fat of the pancreas and practically all of the choline, is found to be inert whereas the fat-free alcohol extract retains the activity of the whole gland. The fat-free alcohol extract has now been sufficiently purified so that a preparation has been secured that is effective on oral and subcutaneous administration in daily doses of from 60 to 100 mg. of dry substance. These extracts contain no lecithin and only insignificant amounts of free choline.

DR. M. HERBERT BARKER, Chicago: Some six years ago I presented slides and work which appeared much like these given today. Those experiments are interesting today because here again another deficiency comes out as marked fatty infiltration. I was interested in seeing the apparent fibrosis of the liver. In our experience there was no fibrotic change that we could see. If the animal was fed nitrogen his liver recovered. Sections of livers of animals before treatment was started revealed high concentrations of fat, and many of them had extensive fibrotic change. I would like to hear comment on the nature and rate of progression of this fibrosis.

DR. PAUL STARR, Chicago: Were there pathologic changes in the pancreas in these animals?

DR. M. A. SPELLBERG, Chicago: This study was not undertaken with the idea of proving or disproving the efficacy of lipocaiic as a lipotropic agent. Our aim was to ascertain whether lipocaiic or choline had any influence on the type of fatty liver produced by us. So far as the dosage is concerned we felt that in view of the opinion expressed in one of Dr. Dragstedt's earlier papers (Dragstedt, L. R.; Prohaska, J. V., and Harms, H. P.: *Am. J. Physiol.* **117**:175 [Sept.] 1936) from 1 to 1.5 Gm. of this extract is sufficient to prevent fatty liver in a dog whose body weight is twenty times or more that of our guinea pigs, approximately 0.5 Gm. used on our animals would seem sufficient. The use of larger amounts would encounter some technical difficulties. We administered the material in aqueous solution with a syringe by mouth. This had to be done forcibly. There was only one guinea pig that had extensive fibrosis, which was true cirrhosis with ascites and edema. This animal survived 154 days. We had only a few others that lived that long, but in the others no fibrosis was detected. It is difficult to keep these animals alive for a long period because they succumbed easily to secondary infection. The rabbit that was permitted to live 142 days did show microscopically increased fibrous tissue in the liver. This animal may prove to be better fitted for the production of fibrosis than the guinea pig. These diets are not deficient in proteins, carbohydrates or fats and are supposed to contain all the accessory food factors except ascorbic acid. The pancreas was normal to gross inspection. The urine was tested a number of times and no glycosuria detected. We have no reason to believe that the pancreas was damaged.

Absence of Toxic Manifestations Following the Parenteral Administration of Promin

DR. RICHARD M. JOHNSON, Eloise, Mich.: The oral administration of promin nearly always results in a moderately severe cyanosis similar to that commonly observed after giving sulfanilamide. Oral ingestion of 25 to 35 mg. of promin (sodium p,p'-diaminodiphenylsulfone-N,N'-di-dextrose sulfonate) per kilogram of body weight each twenty-four hours often resulted in toxic manifestations similar to, but milder than, those reported after large doses of sulfanilamide. The parenteral injection of as much as 300 mg. per kilogram of body weight in twenty-four hours did not lead to the development of cyanosis and did not produce toxic signs or symptoms of any kind in 274 patients given more than 5,000 injections of over 12,000 Gm. The usual parenteral dosage was from 50 to 100 mg. per kilogram of body weight in twenty-four hours.

After oral and parenteral administration, the amount of promin in the blood, spinal fluid, saliva, exudates, transudates and urinary excretion was determined by a modification of Marshall's method for the determination of sulfanilamide. The concentration of promin in these secretions, exudates and transudates closely approximated that present in the blood stream. When promin was administered parenterally, from 95 to 100 per cent was recovered as free promin in the urine from thirty-six to forty-eight hours after administration. A much smaller amount (about 30 per cent) of orally administered promin was recoverable over a more prolonged period (ninety-six hours), and 20 per cent of this recoverable promin was in the conjugated form. This suggests that the substance or substances which produce the cyanosis, toxic manifestations and conjugation may be formed in the gastrointestinal tract.

Dextrose-Citrate Mixture for Preservation of Blood for Transfusion

ELMER L. DEGOWIN, M.D., JOHN E. HARRIS, M.S., and E. D. PLASS, M.D., Iowa City: Rates of hemolysis in samples of human blood preserved in various mixtures at 5 C. for one month were studied. Minimum hemolysis occurred in mixtures containing 10 volumes of blood, 13 volumes of 5.4 per cent anhydrous dextrose in water and 2 volumes of 3.2 per cent dihydric sodium citrate in water. At the end of a month's storage, blood in the dextrose-citrate mixture had hemolyzed only from one twenty-fifth to one fiftieth as much as did blood in citrate solutions alone or in citrate-saline mixtures. During

storage the potassium of the erythrocytes diffused into the plasma, where it attained maximum concentration in about fifteen days. Transfusions into human beings of blood with maximum plasma potassium were accompanied by no clinical, chemical or electrocardiographic evidence of toxicity. The prothrombin disintegrated slowly, remaining above 50 per cent of normal at the end of twenty days' storage when titrated by the method of Smith, Warner and Brinkhous.

DISCUSSION

DR. O. H. ROBERTSON, Chicago: I consider this work timely because of the war in Europe, which may at any moment result in large casualties. In such an event blood transfusions will be employed extensively. During the last war I had the opportunity to try out preserved blood for transfusion using the technic of Rous and Turner, who were the first to devise an effective method for preserving the red blood cells for relatively long periods. Before giving the blood it was necessary to siphon off the supernatant fluid on account of its large bulk and the amount of contained sodium citrate. The sedimented cells were then resuspended in a solution of 2.5 per cent gelatin in physiologic solution of sodium chloride equivalent in volume to the original plasma. This solution has about the osmotic pressure of normal blood plasma. Transfusions with such blood seemed to be just as effective as with fresh citrated blood, and I used blood stored twenty-six days with apparent good results. Requirements for transfusions under war conditions are different from those in times of peace. Wounded men who need transfusion are frequently in a state of shock either with or without hemorrhage, and one must give them solutions that will not escape from the blood vessels since the prime consideration in the treatment of shock is the restoration of the blood volume. The one advantage of simple citration for the preservation of blood lies in the fact that the plasma proteins undergo but little dilution. However, the usefulness of this method is much restricted, since citrated blood begins to hemolyze after ten days. Dr. DeGowin's modification of the Rous-Turner method has removed one of the difficulties in the dextrose-citrate technic, namely that of the bulk and citrate content of the preserving fluid. His data show that the transfusion of the whole mixture of cells and preserving fluid works excellently in conditions of depleted red blood cell volume, but I wish to bring up the question as to how effective this diluted plasma would be in restoring the total blood volume in patients suffering from shock. This point is important in the general applicability of the method. I wonder if the authors have made any observations on the restoration and maintenance of blood volume in conditions of shock after transfusion with this kind of blood.

DR. WARREN B. COOKSEY, Detroit: The considerations that one is primarily interested in are the practical values of this work. I am sure the authors will agree that in the use of preserved blood the usual amount of hemolysis is of no great significance unless very large quantities of blood are given. Because of such studies, I set up our blood bank at Harper Hospital in Detroit on the basis of what I believe are the three major principles to be considered: First, small amounts of blood, frequently repeated if necessary, should give a wider margin of safety; so our blood bank uses only units of 250 cc. of blood and 50 cc. of 2.5 per cent citrate. Second, because of the problems presented by hemolysis, potassium ion diffusion and prothrombin loss, not too old blood should be used; so we convert all blood into useful plasma when it is seven days old. Hence most of our preserved blood is given when only from two to four days old. Third, the mechanical factors, such as an air-tight container and filtration through a fine mesh filter system, can be added safeguards; so such methods were devised. That these considerations seem justified is apparently borne out by the fact that following the administration of the first 700 bottles of blood from the bank only eight reactions occurred, and most of them were extremely mild.

DR. HEINRICH NECHLES, Chicago: Drs. Levinson and Neuwelt and I have studied the possibility of using serum instead of blood transfusions. We have found that in shock

from hemorrhage, even when hemoglobin is low, the most immediate need is not for red cells but for restoration of circulatory volume. Even when blood loss is so great that red cells are needed, immediate transfusion of serum will keep a patient alive until a transfusion with blood has been prepared. Serum is available immediately; it can be put up in sterile containers and may be kept for long periods (eighteen months). It is given without typing, because when pooled serum is injected the agglutinins are neutralized; it need not be kept cold and can be transported easily. In view of the great delay connected with blood transfusions in hospitals without blood banks, as well as at the battle front, we propose the immediate use of serum instead of blood in cases of shock from hemorrhage.

DR. ELIZABETH H. SCHIRMER, Chicago: May I ask whether the authors find that the shape of the flask has any influence on the hemolysis of the red cells?

DR. ELMER L. DEGOWIN, Iowa City: In preserved blood one is always dealing with hemolyzed blood. Hemolysis begins immediately with storage; it does not begin when the blood is shaken, nor is there a hemolysis-free interval of days or weeks. The suitability of this blood for transfusion depends on how much free hemoglobin the recipient will tolerate without danger. The only data available are those of Ottenberg and Fox by which they showed that the human kidney has a threshold for hemoglobin of around 4 or 5 Gm. To answer Dr. Robertson, we have not made any studies on the dilution of serum proteins with reference to shock. We have given the blood-dextrose-citrate mixture to patients in shock and they have recovered satisfactorily. It is assumed that the dextrose disappears from the serum much faster than does the protein, but there is no proof. The question has been brought up about the reaction from blood transfusions. There is a great deal of confusion about this, and the types of reactions must be specified. The causes of none of the types of reaction are known except those due to incompatible blood and those due to the presence of pyrogens. In answer to Dr. Schirmer, we have made no observations on the shape of the flask giving optimal conditions, but we do know that when blood is stored in a flask from which all the air is excluded by displacement with the preservative mixture there will be less hemolysis than when blood is exposed to the air.

Refractory Hemolytic Anemia

DRS. JOHN C. SHARPE and J. P. TOLLMAN, Omaha: From the large, ill defined group of blood dyscrasias termed "splenic" or "hemolytic" anemia, we have separated five cases which are distinctly different from both a clinical and a pathologic point of view. Two men and three women, whose ages varied from 22 to 63 years, had a progressive, subacute course of weakness and jaundice. In each a severe degree of macrocytic anemia, acholuric icterus, reticulocytosis and bone marrow hyperplasia was found. The irrelevant family history, the normal erythrocytic fragility and the absence of spherocytes distinguished this type from familial hemolytic jaundice. Various forms of medical treatment failed. Splenectomy was performed in each instance without improvement. Microscopic studies of the hemopoietic system disclosed a surprising histiocytic reaction within the spleen. The recognition of such a condition as a separate clinical entity is important from the prognostic and the therapeutic point of view.

DISCUSSION

DR. CHARLES A. DOAN, Columbus, Ohio: Analysis of the investigations of the past decade centering about the rationale of splenectomy in a hemolytic type of anemia would seem at present to place such persons in one of four possible etiologic categories: 1. There are patients with a family and personal history and with the physical and laboratory features characteristic of congenital hemolytic jaundice. Splenectomy of these patients, successfully accomplished, always results in a prompt and usually a permanent remission, irrespective of the pre-operative chronicity or acuteness of the clinical manifestations, if all splenic tissue is removed. Such patients, however, have been found to harbor ectopic splenic tissue and to show multiple free accessory spleens more frequently and more exten-

sively than the average normal person. 2. Therefore when recurrences develop in splenectomized patients with hemolytic anemia the tendency is for the physician to transfer his thinking toward other than the splenic mechanisms of hemolysis. A considerable proportion of these patients with recurrences, when subjected to reexploration, show hypertrophied splenic rests with clasmotocytic hyperplasia and excessive erythrocyte phagocytosis comparable to that seen in the original enlarged splenic parenchyma. The first patient successfully splenectomized during an acute hemoclastic crisis in our series of cases of hemolytic jaundice remained entirely well clinically and in normal hemopoietic equilibrium for four years. Then the hemolytic anemia recurred with a gradual but steadily progressive downhill course. When the red count reached 2,000,000, the abdomen was reopened and three small accessory spleens were removed. At the same time a liver biopsy was made and a mesenteric lymph node secured for microscopic study. Only the splenic tissue showed the typical hyperplasia of clasmotocytes with excessive phagocytosis of red cells. The second remission, which followed immediately, has continued until the present time (two years). 3. A third group of patients probably represent either widespread diffuse reticuloendotheliosis involving the Kupffer cells of the liver and macrophages of other organs and the connective tissues generally, or an invisible implantation of ectopic splenic tissue within other organs. These instances occur much less frequently than one might be led to expect, if it is assumed that all the phagocytic mesenchymal elements have a common origin and serve a common function. Elimination by excision, of course, is impossible under these circumstances, and other means and methods of inhibiting or destroying excessive red cell phagocytosis must be conceived and invoked. 4. Anemia due to endogenous or exogenous hemolysin may superficially resemble and occasionally simulate the congenital type of hemolytic jaundice. In one such case in our experience all splenic tissue found at operation was removed, but only an incomplete and transitory remission followed, and at necropsy it was not possible to explain the death on an anatomic basis. The cases reported by Drs. Sharpe and Tollman today would seem to come under the fourth heading. I should like to inquire whether any studies were made on any of the patients cited which would throw light on a possible soluble serum or plasma hemolysin as the basic cause. It is well to have our attention focused on this group of atypical hemolytic anemias which fail to respond to splenectomy and which vary in other essential details from the more classic type of congenital hemolytic icterus. It is quite apparent that they are due to an entirely different mechanism.

DR. S. M. GOLDHAMER, Ann Arbor, Mich.: I cannot understand the reason for calling the anemia macrocytic when I notice that the mean corpuscular volume was normal or below normal. Little is known about the function of the spleen. Its removal may aid the patient but does it alter the disease, as the fragility and the cells remain abnormal? I should like to ask the rationale of removal of the spleen without knowing the etiology of the disease.

DR. MOSES BARRON, Minneapolis: I should like to ask why all these cases were grouped together. The anemias were called macrocytic but it was stated that the cells were small and that definite leukopenia was present. From the description the cases seem to belong to a group which is generally classified as Banti's disease, and I should like to know why they were classified as hemolytic anemias. It was mentioned that they presented acholuric jaundice but it was stated that the patients all had gallstones. Was this true acholuric jaundice or was the jaundice perhaps due to the gallstones? I consider this group as cases of Banti's disease.

DR. M. M. HARGRAVES, Rochester, Minn.: I should like to ask if they had a history suggestive of paroxysmal hemoglobinuria. I have seen three in the past year and have one under my care at present. The histories were suggestive of paroxysmal hemoglobinuria.

DR. FRANK H. BETHELL, Ann Arbor, Mich.: I am interested in the histiocytic reaction observed in the spleens in these cases. Perhaps this reaction was disseminated; I should like to know if an increase in histiocytes was found in the

bone marrow specimens. If so, the hemolysis in these cases might be due to neoplastic proliferation of phagocytic reticulo-endothelial cells.

DR. JOHN C. SHARPE, Omaha: There was no evidence of any accessory spleen or hemolymph nodes present either at operation or at the complete postmortem examinations in the three fatal cases. Dr. Goldhamer asked our rationale for removal of the spleen. Splenectomy was performed only after every other effort had been made to stop the hemolytic process. With regard to the macrocytosis, the average mean corpuscular volume of 110 cubic microns in these cases is definitely above that seen in normal persons in Omaha. Dr. Barron asked whether or not these were cases of Banti's disease. There was certainly no postmortem evidence of this. In answer to Dr. Hargrove's question concerning the presence of paroxysmal hemoglobinuria, we could obtain no history of such a phenomenon nor were there any signs pointing to it at the time of our contacts with the patients. Dr. Bethel asked about the bone marrow studies; we can only say that there is no evidence of a histiocytic reaction within the bone marrow.

Use of Aminophylline (Theophylline Ethylenediamine) to Control Bronchial Spasm Induced by Histamine

RICHARD H. YOUNG, M.D., and ROBERT P. GILBERT, A.B., Chicago: Although the use of aminophylline as an aid to asthma therapy has received considerable attention from clinicians, but little study has been made of the pharmacology of its action on the bronchial musculature. Using the method of Torald Sollmann and A. J. Gilbert, some camera lucida and cinematic studies were made on the reactions of the smaller bronchi and bronchioles in rabbit lung sections. Aminophylline was found to lessen greatly the constricting action of histamine. Further work with guinea pigs showed it to exert a decided protective influence in histamine shock, in which condition it nearly abolishes the severe respiratory symptoms and in many cases seems to prevent the asphyxial death which usually occurs. Experiments are under way to determine its effect, if any, in anaphylactic shock. Other purine derivatives and constricting drugs are also being tried.

Treatment of Chronic Urticaria with Intravenous Injections of Histamine

DRS. H. L. ALEXANDER and ROBERT W. ELLIOTT, St. Louis: During the past few years there have been an increasing number of reports concerning the successful treatment of chronic urticaria with histamine given subcutaneously and by iontophoresis. The rationale of this treatment has never been clearly explained. In the series here reported, histamine has been administered intravenously for the first time to our knowledge as a therapeutic agent. Fourteen patients with chronic intractable urticaria were given this drug by intravenous injection, and eleven secured prompt and complete remission of symptoms. Relapses of three of the eleven occurred but further injections again were successful. Patients in a control series receiving histamine subcutaneously improved, but the results with intravenous injections were by far more prompt and lasting. The technic of intravenous injection was given as well as a discussion of the rationale of this type of therapy.

Physiologic Effects of Histaminase and Histamine

GRACE M. ROTH, Ph.D., and BAYARD T. HORTON, M.D., Rochester, Minn.: We determined the normal response of gastric acidity to subcutaneous injection of histamine. Several days after the response had been accurately established, histaminase was introduced into the duodenum from twenty-five to thirty minutes before subcutaneous injection of histamine. Introduction of the histaminase practically abolished the rise of gastric acidity. Likewise, subjects were immersed in water at 24 C. (75 F.) and the curve of their gastric acidity under such conditions was similar to that caused by histamine. The same procedure was carried out as in the first observations except that the subjects were immersed in water at 24 C. (75 F.) instead of receiving subcutaneous injection of histamine. Introduction of the histaminase abolished the rise in gastric acidity and in some instances definitely caused gastric acidity to decrease. Several days after the normal response

to histamine had been determined, histaminase was injected intramuscularly thirty minutes before the usual subcutaneous injection of histamine. Again the histaminase practically abolished the rise in gastric acidity. In addition, following the administration of histaminase by duodenal tube and by intramuscular injection the other systemic effects from the subcutaneous injection of histamine were practically abolished. We feel that we now have physiologic evidence that histaminase administered to man will inhibit the action of histamine.

DISCUSSION ON HISTAMINE

DR. CARL DRAGSTEDT, Chicago: Experimental analysis of certain hypersensitive reactions such as anaphylactic shock and peptone shock in animals has shown that these reactions are due to an interaction between antigen or allergen and body cells, with a resulting liberation of certain cellular products which in turn produce the characteristic effects of the reaction. Circumstantial evidence indicates that the allergic reactions of man have a similar mechanism. At present, histamine and heparin are the only two cellular products that have been identified in animal experiments. The implication of these observations on the management of allergic reactions is that, in addition to specific desensitization procedures, one can attempt the use of chemical or pharmacologic antidotes to the cellular products apparently most concerned. These papers today indicate three varieties of approach to this end, namely a pharmacologic antagonism to histamine by means of theophylline, a chemical antagonism to histamine by means of histaminase, and the development of what might be called tolerance to the effects of histamine by the repeated administration of histamine itself.

DR. BAYARD T. HORTON, Rochester, Minn.: A man who suffered excruciating headaches for years was relieved by the administration of histaminase. The pain of which the patient complained was limited to one side of the head. It was a constant, excruciating, burning, boring type of pain which involved the right eye, the temple, the neck and the face. It had none of the tic-like qualities of trigeminal neuralgia and there were no trigger zones. The headache occurred with clocklike regularity, particularly at night. Coincident with the onset of pain, the patient invariably described phenomena of vasodilatation which occurred on the same side of the head as the pain. These consisted of engorgement of the soft tissues of the eye as well as injection of the conjunctiva, plugging of the nose, profuse watering of the eye and nose and flushing of the side of the face. The syndrome, which in every respect corresponded to spontaneous attacks, was produced by the subcutaneous administration of 0.5 mg. of histamine. The patient has remained free from attacks while taking histaminase (T. 360-K).

DR. R. ELLIOTT, St. Louis: Although we began using histamine intravenously on the theory that we could maintain a period of unresponsiveness to the formation of H substance, which in turn is responsible for whealing, we have since been forced to abandon this hypothesis. Since improvement in our cases has persisted for weeks and months, we now suspect that the injection of histamine evokes histaminase and that the latter accounts for the success of this form of treatment.

Changes in Venous Blood Carbon Dioxide Content in Patients Subjected to Rebreathing Experiments

HARRY LANDT, M.D., JULIEN E. BENJAMIN, M.D., and NORMAN JOSEPH, Ph.D., Cincinnati: Rebreathing experiments were made on seven cardiac and seven normal patients at basal conditions. Venous blood samples were collected (stasis free) under oil at minute intervals. Simultaneously gas samples were taken from the rebreathing chamber. The blood and gas samples were analyzed for the oxygen and carbon dioxide content. The gas samples showed almost entire absence of carbon dioxide and of course a progressively diminishing oxygen content. Both cardiac and normal patients failed to show any great difference in the venous blood oxygen content. There was a striking decrease in the venous blood carbon dioxide content in cardiac patients, while the carbon dioxide content in the venous blood in normal patients tended to increase. Explanations are offered for these observed changes.

(To be continued)

Current Medical Literature

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Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 169-200 (Dec.) 1939

- Pellagra and Its Modern Treatment, with Special Emphasis on Border-line States. J. B. McLester, Birmingham.—p. 169.
Study of Nephritis. L. W. Roe, Mobile.—p. 172.
Importance of Early X-Ray Diagnosis in Gastrointestinal Disease. H. M. Simpson, Florence.—p. 175.
Tuberculosis Control Activities in a North Alabama County. R. E. Harper, Tusculum.—p. 177.
Feeding Schedule During the First Year. C. E. Abbott, Tusculum.—p. 180.

American Journal of Clinical Pathology, Baltimore

9: 581-628 (Nov.) 1939

- Further Simplification of Kolmer Complement Fixation Test for Syphilis. J. A. Kolmer, Philadelphia.—p. 581.
Blood Donor Registry as Substitute for Blood Bank. C. A. Pons, Neptune, N. J.—p. 587.
Problems in Blood Banking. L. W. Diggs and Alice Jean Keith, Memphis, Tenn.—p. 591.
*Pathologic Anatomy of Human Brucellosis. S. M. Rabson, New York.—p. 604.
Carcinoma of Esophagus Perforating Aorta. H. J. Schattenberg and J. Ziskind, New Orleans.—p. 615.

Pathologic Anatomy of Human Brucellosis.—Rabson reports a case in which compound fractures of the arm were sustained by a tractor operator aged 28 while working in a farmyard. Soon afterward, and continuing until death eight months later, he had repeated attacks of fever associated with anemia and leukopenia. The macroscopic agglutination test with *Brucella abortus* was positive in dilutions through 1:320. General visceral congestion and evidence of continued breakdown of erythrocytes was observed at necropsy. Granulomas were found in the bone marrow, in the splenic veins and in the enlarged liver and spleen. These consisted of epithelioid cells, lymphocytes and giant cells, many of which were multi-lobated and resembled enlarged megakaryocytes. The granulomas were similar to those described in the literature. The relative rarity of the finding of granulomas is explained by the comparative ease of the body to overcome brucellar infection finally. Only in protracted illness is the characteristic granuloma formed.

American J. Digestive Diseases, Huntington, Ind.

6: 693-760 (Dec.) 1939

- Diffuse Spasm of Lower Half of Esophagus. H. W. Schmidt, Rochester, Minn.—p. 693.
The Problem of Gastric Hyperacidity. A. L. Bloomfield, San Francisco.—p. 700.
Effect of Pregnancy and of Antuitrin-S on Cinchophen Ulcers in Dogs. A. A. Farbman, D. J. Sandweiss and H. C. Saltstein, Detroit.—p. 702.
Calcium Content of Gastric Juice. J. B. Kirsner and J. E. Bryant, Chicago.—p. 704.
Effect on Gastric Secretion of Introducing Diluted Hydrochloric Acid into Duodenum: Study of Normal Humans and Duodenal Ulcer Patients. R. E. Stevens, H. L. Segal and W. J. M. Scott, Rochester, N. Y.—p. 706.
Lymphogranuloma Venereum: Surgical Aspects. B. A. Kornblith, New York.—p. 712.
Intravenous Modification of Hippuric Acid Test for Liver Function. A. J. Quick, Milwaukee.—p. 716.
Use of Pectin-Agar Mixtures in Diarrhea. G. W. Kutscher Jr. and A. Blumberg, Asheville, N. C.—p. 717.
Perforation of Gallstone into Stomach with Resulting Pyloric Obstruction: Case Report with Gastroscopic and Surgical Findings. H. L. Segal and J. J. Morton, Rochester, N. Y.—p. 720.
Complete Biliary Fistula of Four Years' Duration with Hemorrhagic Tendency. L. K. Ferguson and D. G. Calder Jr., Philadelphia.—p. 722.
Carcinoid Tumors of Small Intestine. I. Kross, New York.—p. 725.

American Journal of Diseases of Children, Chicago

58: 1157-1420 (Dec.) 1939

- *Disabling Diseases of Childhood: Their Characteristics and Medical Care as Observed in 500,000 Children in Eighty-Three Cities Canvassed in National Health Survey of 1935-1936. Dorothy F. Holland, Washington, D. C.—p. 1157.
Factors Affecting Retention of Nitrogen and Calcium in Period of Growth: II. Effect of Thyroid on Calcium Retention. J. A. Johnston and J. W. Maroney, Detroit.—p. 1186.
The Play Interview: Method of Studying Children's Attitudes. J. H. Conn, Baltimore.—p. 1199.
*Sex Ratios in Families with Hemophilia. Madge Thurlow Macklin, London, Ont.—p. 1215.
Effect of Hyperimmune Human Serum (Lyophile) and of Sulfapyridine on Experimental Murine Pertussis. W. L. Bradford and Mary Wold, Rochester, N. Y.—p. 1228.
Effect of Hyperimmune Human Serum (Lyophile) on Humoral Antibody Titer in Pertussis. C. Katsampes, Rochester, N. Y.; A. C. McGuinness, Philadelphia, and W. L. Bradford, Rochester, N. Y.—p. 1234.
Function of Thyroid and Pituitary in Mongolism, with Report on Blood Groups of American Mongoloid Defectives and Comments on Determination of Cholesterol. C. E. Benda and Emily May Bixby, Wrentham, Mass.—p. 1240.

Disabling Diseases of Childhood.—Holland says that, in a canvass of eighty-three representative urban communities conducted by the United States Public Health Service in 1935-1936, records of illness and medical and nursing care received in a twelve months period were obtained for 518,767 white children under 15 years of age. Disabling illnesses occurred with greater frequency among children under 10 years of age than among persons in any subsequent period except old age. The duration of the average disabling illness was found to be lowest among children, and except in the period of infancy the rate of recovery from illness was higher among children than among adults. Four in every five disabling illnesses occurring among children under 15 years of age were due to acute communicable diseases or diseases of the respiratory tract. In general, a smaller proportion of the disabling illnesses of children than of adults received care from a physician in the home, clinic or physician's office. In cities with a population of 100,000 and over, one in twenty-four children under 15 years of age had been a hospital patient in the year of survey; in the cities of population under 25,000 the ratio was one to thirty-eight. Over half of the hospital cases among children were surgical; diseases of the tonsils and adenoids alone accounted for about two fifths of the cases. Among children in families on relief and in self-sustaining families with incomes up to the \$2,000 level the proportion of disabling illnesses receiving care from a physician outside the hospital was lower than in families with incomes of \$3,000 and over. This relation was observed consistently in the large, medium-sized and small cities. For all of the diseases of childhood the illnesses of children attended by a physician outside the hospital received more intensive care in families with high than in those with low incomes. The average number of hospital days per child patient, however, was consistently higher among families with low incomes.

Sex Ratios and Hemophilia.—Macklin's curiosity was aroused by the contradictory statements of Eley and of Birch as to alterations in the sex ratio found in families with hemophilia. Eley maintained that transmitters of hemophilia usually have more daughters than sons. Birch stated that the children of transmitters of hemophilia are predominantly male (63 per cent male and 37 per cent female) and that the children of persons with hemophilia are more apt to be female than male. To test the truth of these statements the author analyzed the pedigrees of the transmitters of hemophilia, the pedigree of bleeders and the ratio of unaffected to affected males in families with hemophilia. She found that in families of transmitters collected at random there are more males than females in a ratio of 58.3 to 41.7, owing to the fact that most transmitters are recognized only because they have males in their families in whom the disease develops. When the data are analyzed, computing the number of males one should expect, the excess is found to be apparent, not real. In the families of hemophilic males in which daughters have been said to predominate there was a slight excess of females in a ratio of 54.3 to 45.7. Here again the departure from the expected

value was not outside the limits of what might occur in a sample of this sort. It has been claimed that the ratio of affected to unaffected was much higher than the expected 50:50 ratio. Again, because of the fact that a woman is known for the most part as a transmitter because she has affected sons, the material used to determine the incidence of affected males is weighted in favor of the affected group at the outset. If the incidence is determined only from families of transmitters who are identified by the fact that they had hemophilic fathers, this preponderance of affected males disappears and the ratio of affected to normal is well within the limits of the expected 50:50 ratio. The unaffected actually outnumbered the affected in the series collected, namely 53.2 per cent. Therefore there appears to be no adequate basis for the idea that the sex ratio is disturbed in families bearing the trait of hemophilia, males and females appearing equally in the offspring of transmitters and of affected males, and the defect appearing in about one half of the sons of women who are transmitters.

American Journal of Medical Sciences, Philadelphia

1938: 737-876 (Dec.) 1939

- A Law of Denervation. W. B. Cannon, Boston.—p. 737.
 Blood Viscosity, with Special Reference to Capillary, Arterial (Approximate) and Venous Blood Specimens. A. A. Holbrook and M. Virginia Watson, Milwaukee.—p. 750.
 *Clinicohematologic Evaluation of Bone Marrow Biopsies. M. Morrison and A. A. Samwick, Brooklyn.—p. 758.
 Auricular Standstill: Its Occurrence and Significance. F. F. Rosenbaum and S. A. Levine, Boston.—p. 774.
 Studies on Iontophoresis: I. Experimental Studies on Causes and Prevention of Iontophoretic Burns. H. Molitor and L. Fernandez, Rahway, N. J.—p. 778.
 Experimental Studies on Toxicity of Benzedrine Sulfate in Various Animals. W. E. Ehrlich, F. H. Levy and E. B. Krumbhaar, Philadelphia.—p. 785.
 Anemia Induced in Rats by Means of Sulfanilamide. T. E. Machella and G. M. Higgins, Rochester, Minn.—p. 804.
 Epinephrine in Oil: Its Effectiveness in Symptomatic Treatment of Bronchial Asthma. E. L. Keeney, Baltimore.—p. 815.
 *Clinical Experiments with Male Sex Hormones: II. Further Observations on Testosterone Propionate in Adult Hypogonadism and Preliminary Report on Implantation of Testosterone. J. E. Howard and S. A. Vest Jr., Baltimore.—p. 823.
 *Evaluation of Vitamin B₁ (Thiamin Chloride) in Treatment of Polyneuritis. M. G. Vorhaus, New York.—p. 837.

Value of Bone Marrow Biopsies.—Morrison and Samwick performed 275 bone marrow studies, obtaining the bone marrow fluid by sternal aspiration. Normal bone marrow was obtained from twenty-eight individuals free of infection, hemorrhage and malignant or other diseases. Bone marrow aspirations were of great diagnostic aid in forty-seven cases in which clinical signs and symptoms and routine blood examinations failed to be of assistance. These were cases of Hodgkin's disease, carcinoma, infections, anemia of pregnancy, pernicious anemia, anerythroplastic anemia, infectious mononucleosis, Gaucher's disease, aplastic anemia, both varieties of leukemia and atrophic cirrhosis of the liver. Observations of leukogenesis in this series confirmed the "shift to the left" theory of Arneith and Schilling as far as the bone marrow was concerned. The most marked left shifts were, in the order named, in acute myeloid leukemias, chronic myeloid leukemias, granulocytopenia, infections and malignant diseases. Slighter degrees of left shift were found in treated pernicious anemia, Niemann-Pick's disease, Cooley's anemia, liver and gallbladder diseases and infectious mononucleosis. Diseases in which left shift was negligible or shifted to the right were polycythemia vera, hemorrhagic purpura, untreated cases of pernicious anemia, pernicious-like anemias and certain cases of arthritis and Hodgkin's disease. A point of marked value in the differentiation of myelosis and granulocytopenia is the unimpaired erythroid activity in granulocytopenia, while in acute myelosis it is definitely depressed. The normoblast-erythroblast ratio is markedly depressed in chronic myeloid leukemias and the granulocyte-normoblast ratio is not as marked as that occasioned by the leukemoid reactions. The most characteristic pathognomonic observation was the unequivocal lymphatic infiltration of the bone marrow seen in lymphatic leukemia. In eighty-five cases in which there was moderate erythropoiesis in the bone marrow there was no evidence in the periphery

of such activity in thirty-six cases. This shows that bone marrow biopsies serve to acquaint one with conditions concerning erythropoietic activity which cannot otherwise be determined in routine peripheral blood examination. Erythropoiesis was most marked in the hemolytic anemias, hemolytic icterus, sickle cell anemia, Cooley's anemia, Niemann-Pick's disease, occasional cases of pernicious anemia and a few cases of Hodgkin's disease. It was slightly increased in malignant conditions, polycythemia vera and infections. Increased erythropoietic activity was absent in leukemias. An increased number of megakaryocytes was found in the cases of hemorrhagic purpura, even exceeding that found in cases of Hodgkin's disease. Certain criteria proving of great diagnostic aid in the study of various conditions was as follows: In carcinoma of the stomach there was always a maturative defect of the erythrocytes. In other malignant conditions the nonsegmented-segmented and granulocyte-erythroblast ratios were frequently increased. In infections there was a constant increase in left shift involving the metamyelocytes and the staff forms. The nonsegmented-segmented and granulocyte-normoblast ratios were also shifted to the left. Since the same is true of malignant diseases, the absence of fever associated with the blood picture would favor a diagnosis of a malignant condition and rule out infection. Certain diagnoses could not have been made accurately except by means of the bone marrow, for example the finding of Gaucher cells, Niemann-Pick cells and plasma cells. The presence of an increase in plasma cells would speak for a multiple myeloma if corroborative clinical evidence is available, since the latter may be present in certain aplastic or myelophthisic anemias.

Testosterone Propionate for Adult Hypogonadism.—Howard and Vest report observations, extending over two years, on the effects of testosterone propionate in sesame oil given by hypodermic injection to twenty-two adult patients suffering from hypogonadism. Development or reestablishment of secondary sex characteristics with induction of normal libido and potentia ensued in all cases. The dosage for adequate maintenance and optimal therapy was 25 mg. twice a week. Smaller doses, if given more frequently, seemed equally effective, but if injections were given only twice a week doses smaller than 25 mg. proved inadequate. Last year following the work of Thorn, the authors began to implant pellets of from 100 to 800 mg. of pure crystalline testosterone in ten hypogonad patients. The patients who had thus been transferred from injection to pellet therapy have reported enthusiastic and gratifying results. No patients have thus far reported overstimulation effects. Since injection treatment leaves much to be desired, because the injections should be given by physicians and two trips a week to a physician's office for life is rather a strenuous program to anticipate, the extraordinary effectiveness of pellets of crystalline hormones implanted beneath the skin is promising.

Thiamin Chloride for Polyneuritis.—Vorhaus cites the results of treating 520 cases of polyneuritis with thiamin chloride. No improvement occurred in fifteen, partial improvement occurred in 189, and freedom from symptoms occurred in 316. The 505 patients who were improved after taking thiamin chloride for an average of nine weeks were kept under observation after discontinuing this treatment. At the present time 315 have had one or more recurrences of their symptoms. Of 170 patients observed up to one year after discontinuing thiamin, 21 per cent showed recurrences. Of the 111 followed for from one to two years after discontinuing thiamin, 71 per cent showed recurrences. Of the ninety-five observed from two to three years 85 per cent and of 123 followed for more than three years 96 per cent showed recurrences. Improvement in symptoms usually begins to be apparent within three weeks and by nine weeks of thiamin therapy improvement reaches its maximum in most cases. Readministration of thiamin in the treatment of recurrences is highly effective. The author believes it possible that some individuals may have a greater normal need for thiamin than can be obtained from a normal diet. For such cases he suggests the term "primary hypothiaminosis."

American J. Obstetrics and Gynecology, St. Louis

38: 927-1110 (Dec.) 1939. Partial Index

- *Significance of Endocrine Assays in Threatened and Habitual Abortion. J. S. L. Browne, J. S. Henry and Eleanor H. Venning, Montreal.—p. 927.
- Critical Survey of 1,066 Cesarean Sections. H. B. Matthews and H. S. Acken Jr., Brooklyn.—p. 956.
- Bacteriology of Uterus at Cesarean Section. T. K. Brown, St. Louis.—p. 969.
- Glycosurias of Pregnancy. E. Allen, Chicago.—p. 982.
- Studies in Artificial Ovulation with Hormone of Pregnant Mares' Serum. S. L. Siegler and M. J. Fein, Brooklyn.—p. 1021.
- *Treatment of Afterpains and Painful Engorgement in Puerperium with Testosterone Propionate. A. R. Abarbanel, Baltimore.—p. 1043.
- Errors in Diagnosis of Hydrocephalus in Breech Presentation. A. L. Dippel and A. B. King, Baltimore.—p. 1047.
- Irradiation of Cancer of Cervix. Rieva Rosh, New York.—p. 1051.
- Latent Gonorrhea in Obstetric Patients. W. W. Tucker, R. E. Trussell and E. D. Plass, Iowa City.—p. 1055.
- Primary Chorionepithelioma of Fallopian Tube. J. L. Fleming, G. F. Thompson and P. F. Fox, Chicago.—p. 1071.
- Rectal Administration of Evipal Soluble in Obstetrics. G. Rosenblum and A. N. Webb, Los Angeles.—p. 1075.
- Massive Doses of Sulfanilamide in Pregnancy. J. Kotz and M. S. Kaufman, Washington, D. C.—p. 1079.

The Endocrine Mechanism in Abortion.—Browne and his associates determined the excretion of gonadotropic substance, estrogens and sodium pregnandiol glucuronide in twenty-four hour specimens of urine in thirty-five cases of threatened or habitual abortion. In some instances this determination was carried out throughout gestation. They formulate the following theory of the endocrine mechanism in threatened and habitual abortion: The evidence suggests that the ovary and the placenta are two sources of progesterone and estrogens in pregnancy. They interpret the rise in pregnandiol excretion, which occurs from the seventieth to ninetieth days in most normal cases, as being due to the beginning of secretion of progesterone by the placenta. The time at which the transfer of function occurs from ovary to placenta varies in different individuals and in the same individual in different pregnancies. If, however, the corpus luteum ceases to produce progesterone for any length of time before the placenta begins to secrete it, abortion will follow. The time at which a deficiency of corpus luteum hormone is most likely to occur is in the transition period between the ovarian and placental phases (late second and third months). This is the critical period of pregnancy. The cause of many abortions is a faulty gestation from the first; the chorion partakes in this abnormality and produces an amount of gonadotropic substance inadequate to prolong the corpus luteum beyond a certain point. Of other patients whose gestation is less abnormal, the function of the corpus luteum may be prolonged for the usual time and the embryo develop normally, but the placenta may be slow in taking over. Patients in whom either of these conditions occurs repeatedly abort habitually. The use of gonadotropic extracts in early pregnancy when large amounts are present seems likely to have little effect. In patients whose excretion of gonadotropic substance is consistently low, the gestation is already degenerate. In these patients progesterone is obviously useless if given after symptoms of abortion appear. The patients in whom the embryo and placenta develop up to a certain period, but the placenta takes over the function of progesterone formation late or the corpus luteum degenerates early, offer theoretically the most hopeful outlook for progesterone therapy, as in many, if the critical period is successfully passed, the placental function begins and further treatment is unnecessary. The determination of excretion of gonadotropic substance in early pregnancy may enable one to distinguish patients in whom gestation is already degenerate from those for whom treatment might be of benefit. Single determinations are of no value, as some patients having temporary low gonadotropic values in early pregnancy do go to term. Patients who have aborted once or more (without obvious explanation) may yet in a subsequent pregnancy proceed entirely normally. Theoretically, in this group the progesterone should be given before the time of usual onset of symptoms and continued over the critical period. The question of dosage is also difficult to determine, but doses of less than 5 mg. are unlikely to have much effect. This dose should be given daily or every other day and may be increased in the presence of persisting symptoms. Treatment should be concentrated during the period of transfer of the formation of progesterone from the ovary to

the placenta. If pregnandiol assays are available, a definite rise in pregnandiol excretion may be taken as an index that further treatment is probably unnecessary.

Testosterone Propionate for Afterpains and Engorgement of Breasts.—Abarbanel states that 10 mg. of testosterone propionate subcutaneously, given within two hours post partum, prevented afterpains in twenty-two of twenty-five patients. Forty-one of forty-nine patients with severe afterpains experienced adequate relief after 10 mg. of testosterone was divided between the intramuscular and subcutaneous routes. Of fifty patients with severe painful engorgement of the breasts, 10 mg. of testosterone propionate (5 mg. intramuscularly and 5 mg. subcutaneously an hour later) gave practically complete relief to forty-four (92 per cent). No inhibition of lactation was evident in those mothers who continued to nurse their babies.

Annals of Surgery, Philadelphia

110: 961-1130 (Dec.) 1939

- Operative Lengthening of Tibia and Fibula: Preliminary Report on Further Development of Principles and Technic. L. C. Abbott and J. B. deC. M. Saunders, San Francisco.—p. 961.
- Clinical Consideration of Methods of Equalizing Leg Length. P. D. Wilson and T. C. Thompson, New York.—p. 992.
- *Clinical and Experimental Experiences in Surgical Treatment of Hypertension. L. Davis and M. H. Barker, Chicago.—p. 1016.
- Role of Pituitary Gland in Water Balance. P. Heinbecker and H. L. White, St. Louis.—p. 1037.
- Control of Water and Electrolyte Balance in Surgical Patients. J. R. Elkinton, M. T. Gilmour and W. A. Wolff, Philadelphia.—p. 1050.
- *Combined Use of Zinc Peroxide and Sulfanilamide in Treatment of Chronic, Undermining, Burrowing Ulcers Due to Micro-Aerophilic Hemolytic Streptococcus. F. L. Meleney and H. D. Harvey, New York.—p. 1067.
- Fat Embolism. R. I. Harris, T. S. Perrett and A. MacLachlin, Toronto.—p. 1095.
- Report on American Board of Surgery. E. A. Graham, St. Louis.—p. 1115.

Surgical Treatment of Hypertension.—Davis and Barker find that the majority of hypertensive patients observed by them respond favorably to the administration of potassium thiocyanate as evidenced by a drop in the systolic and diastolic blood pressures and a fall in the blood cholesterol, total proteins and hematocrit reading. Headache, insomnia, nervousness, fatigue, dyspnea and heart consciousness are relieved, and an actual decrease in the size of the heart occurs. However, there is a small group of patients who are resistant to thiocyanate therapy. The drug must be pushed to the toxic level in treating these individuals before any effect can be obtained, and the lack of a safe margin makes it impossible to control symptoms or blood pressure successfully. In their experience with these patients, bilateral supradiaphragmatic section of the splanchnic nerves alone has failed to decrease their blood pressure or to cause a fall in the chemical constituents of the blood. However, after operation the authors noticed that four patients responded to the administration of thiocyanate. The blood pressure, systolic and diastolic, has shown a definite drop and there has been a decided improvement in the condition of the patients. There has been a parallel decrease in the blood cholesterol, total protein, urea nitrogen and hematocrit readings which compares favorably with the same responses obtained by patients with hypertension who are sensitive to the thiocyanates. The authors believe that section of the splanchnic nerves has in some unknown manner increased the sensitivity of a small number of patients to thiocyanates.

Zinc Peroxide and Sulfanilamide for Burrowing Ulcers.—Meleney and Harvey believe that the ideal treatment for chronic undermining, burrowing ulcers is as follows: When a patient with such a lesion comes to the hospital, after careful anaerobic and aerobic bacteriologic studies, zinc peroxide powder suspended in sterile distilled water in the consistency of a 40 per cent cream should be applied to the wound, care being taken to use effective material, to get contact and to prevent evaporation. This dressing should be removed daily. At the same time, sulfanilamide should be administered by mouth, 1.2 Gm. every four to six hours. If the patient tolerates the medication, and jaundice, destruction of leukocytes and erythrocytes, fever or delirium does not ensue, sulfanilamide should be continued. If toxic symptoms supervene, sulfanilamide should be discontinued. If after one week there are any areas of activity, an operative procedure is required so

results afford conclusive evidence that (1) extreme hypersensitivity to the sting of the bee and other Hymenoptera, with its hazard to human life, can be eliminated, usually for a period of years, by a series of specific inoculations and (2) large, painful and toxic infiltrations from bites of mosquitoes can be similarly prevented.

Journal of Lab. and Clinical Medicine, St. Louis

25: 225-332 (Dec.) 1939. Partial Index

- Changes in Chemistry of Cerebrospinal Fluid During Encephalography. A. Levinson, I. Kaplan and D. J. Cohn, Chicago.—p. 225.
- *Studies in Blood Preservation: Fate of Cellular Elements in Relation to Potassium Diffusion. C. R. Drew, Katharine Edsall and J. Scudder, New York.—p. 240.
- *Germicidal Properties of Oxides of Nitrogen. H. G. Williams and T. A. Hartgraves, Phoenix, Ariz.—p. 257.
- *Ultraviolet Irradiation and Vitamin C Metabolism. C. W. Jungeblut and Rose R. Feiner, New York.—p. 263.
- Gonorrheal Myelitis with Associated Porphyrinuria Following Sulfanilamide. F. G. Norbury, Jacksonville, Ill.—p. 270.
- Hematologic Study of Seventy-Six Pneumonia Cases Treated with Sulfapyridine, Including Fatal Case of Agranulocytosis. J. R. E. Morgan and H. K. Detweiler, Toronto.—p. 275.
- Stable Adrenal Cortical Extract. R. J. Schachter, Chicago.—p. 281.
- Persistence of Infection with *Giardia Intestinalis* in Man. Dorothy W. Miles and J. T. Culbertson, New York.—p. 286.
- Method of Employing Horse Plasma and Hemoglobin as Enrichments in Primary *Gonococcus* Isolations. Lenore R. Peizer, New York.—p. 299.
- Slide Flocculation Test for Diagnosis of Syphilis: Preliminary Report. S. L. Leiboff, New York.—p. 317.

Blood Preservation and Potassium Diffusion.—Drew and his associates carried out studies to determine whether the previously reported tenfold rise in about thirty days in plasma potassium of preserved blood was a pure diffusion process or whether it was due to actual cell destruction. They state that in heparinized preserved blood there is little or no actual loss in the number of erythrocytes over a period of thirty days. The hemoglobin content remains constant in the total sample, though from 15 to 25 per cent may be found in the plasma. The mean cell diameter of the erythrocytes is reduced about 20 per cent in thirty days. The polymorphonuclear leukocytes are diminished by 50 per cent in forty-eight hours and are amorphous masses in fifteen days. The lymphocytes, monocytes and eosinophils do not disintegrate so rapidly; the latter are particularly well preserved. The thrombocytes rapidly fall to a low level and then remain constant at about 30,000 for some fifteen days.

Germicidal Properties of Oxides of Nitrogen.—From their study of the germicidal action of the nitrogen oxides Williams and Hartgraves find that compressed air passed through an electric arc produces a mixture of gases which is an effective bacteriostatic and bactericidal agent. The bacteriostatic and bactericidal action of this gas is effective in an exposure time of fifteen seconds. The gas is also fungistatic and fungicidal. The vegetative forms of bacteria and fungi are the least resistant to the gas, the spore forms being very resistant. It is believed that the bactericidal power of the gas is due to the formation and deposition of minute amounts of nitric acid and other agents contained in the gas. These as yet have not been analyzed. The gas is easily and economically produced and should find its greatest field of usefulness in the treatment of infected wounds and chronic draining sinuses, particularly osteomyelitis and tuberculous sinuses.

Ultraviolet Irradiation and Vitamin C Metabolism.—Jungeblut and Feiner investigated the relationship that seems to exist between vitamin C metabolism and the effect of ultraviolet rays in the production of disease, when irradiation transcends the threshold of physiologic stimulation. Prolonged ultraviolet irradiation of albino guinea pigs, rabbits and monkeys failed to bring about any change in the tissue levels of vitamin C. When a superficial burn was produced on the skin of guinea pigs by the local application of heat, a more or less marked diminution of the vitamin C stores occurred in the brain, liver, spleen and adrenals. Possibly toxic, histamine-like substances, which have an adverse effect on adrenal function, originate from the burned tissue and require large amounts of vitamin C for their detoxification. This process may be analogous to the well known depletion of vitamin C following the necrotizing action of diphtheria toxin. The intact vitamin C stores after irradiation are of particular interest in view

of Wright's observation that evidence of disturbed vitamin C metabolism occurred only in one individual who showed definite intolerance to ultraviolet irradiation. Evidently a mechanism operates which protects the tissues of some individuals against damage and preserves the vitamin C reserves in the tissues; but the absence of such a mechanism in other individuals, or its breakdown by overdosage of rays, may initiate a derangement of vitamin C metabolism.

Journal of Nervous and Mental Disease, New York

90: 709-844 (Dec.) 1939

- Comparison of Thalamus in Dementia Praecox and Manic Depressive Brains: Biometric Analysis. R. J. Stein, Canandaigua, N. Y., and L. H. Ziegler, Wauwatosa, Wis.—p. 709.
- Difficulties of Being "Normal." L. W. Darrach, Northampton, Mass.—p. 730.
- *Parkinsonian Syndrome Resulting from Electrical Injury: Two Cases. M. H. Weinberg, Pittsburgh.—p. 738.
- Studies in Insulin Treatment of Dementia Praecox: Report of 100 Cases. C. F. Read, Gert Heilbrunn and E. Liebert, Elgin, Ill.—p. 747.
- Trigeminal Neuralgia in Multiple Sclerosis. B. Finesilver, New York.—p. 757.
- Epileptiform Seizures in Insulin Shock Therapy: Clinical Study. D. Goldman, Cincinnati.—p. 765.

Parkinsonian Syndrome from Electrical Injury.—Weinberg reports two cases of parkinsonian syndrome following electrical injury. Both patients have parkinsonian features but differ in certain particulars. One was injured while using the telephone, resulting in deafness on the left side and athetosis. The other was diagnosed as having hemiplegia of the right side with parkinsonism due to a lesion involving the left basal ganglion and internal capsule as a result of electrical injury. The author warns that there is a too ready tendency to diagnose functional disease in such cases. Careful examination should be made for manifestations of organic disease. Because of their great importance and the insufficiency of scientific data on this subject such cases should be reported, so that more may be learned about the neurologic conditions resulting from electrical injuries.

Laryngoscope, St. Louis

49: 1043-1150 (Nov.) 1939

- Review of Available Literature on Pharynx and Pharyngeal Surgery for 1938. F. E. LeJeune, New Orleans.—p. 1043.
- *Studies in Labyrinthine Fenestration to Improve Hearing: Preliminary Report. S. J. Kopetzky, New York.—p. 1064.
- Experimental Production of Deafness in Young Animals by Diet. E. Mellanby, London, England.—p. 1090.
- Use of "Seconal" in Minor Procedures in Otolaryngology. E. H. Lyman, St. Louis.—p. 1119.
- Remarkable Sojourn of Aspirated Foreign Body. C. E. Purcell, Paducah, Ky.—p. 1124.
- Two Congenital Nasal Deformities: Bifid Nose and Bulldog Nose. M. M. Kopp, Brooklyn.—p. 1128.
- Relation of Chest Conditions to Sinus Disease: The Otolaryngologist's Point of View. A. T. Smith, Philadelphia.—p. 1134.
- Functional Vocal Disabilities. W. A. C. Zeffi, New York.—p. 1143.

Labyrinthine Fenestration to Improve Hearing.—Kopetzky declares that the problem of surgical relief to the deafened is far from solution. He urges that the surgical work be continued and that physiologists reexamine, in the light of the data obtained by this surgery, the fundamentals of hearing. On the question of what permanent value surgery holds for the deafened, no final conclusion can be made as yet, but there is reason to believe that something is developing which will be of value in the therapy for deafness. Regarding operative therapy (labyrinthine fenestration) for progressive deafness and otosclerosis the author agrees with Campbell and Canfield that the tissue destined to cover the fenestration is less important than the manner of making the fistula. Contrary to what has been said of the heat caused by the polishing burr, he believes that the heat which the burr produces is one of the most important elements in inhibiting bony closure of the fistula. In some of his best results, as far as maintaining a patent fistula is concerned, he so worked the burr that sufficient heat was created to produce a thermal labyrinthine reaction, evidenced by induced nystagmus, long before the telltale dark line had brought the endosteal layer of the canal into view. When, in the earlier cases, he tried not to produce heat, his results he maintains were not as good as when he disregarded this warning and actually strove to produce a degree of local heat with the burr. The size of the fenestration plays a part in the end results. His best

results have been obtained with a fenestration of from 1 to 3 mm. in length. Before operating, it is necessary to know which ear was first involved in the deafness. That probably is the ear at fault, and he thinks that the second ear has lost function largely because there has been a lack of stimulation to the association centers over a long period from the initially involved side.

Maine Medical Association Journal, Portland

30: 311-350 (Dec.) 1939

Speech and Voice Defects: Various Syndromes. J. S. Greene, New York.—p. 311.
Libraries and the Hospital. J. C. Meakins, Montreal.—p. 321.
Urinary Complications and Water Balance. C. H. Jameson, Rockland.—p. 326.

Medicine, Baltimore

18: 431-504 (Dec.) 1939

Properties of Viruses. W. M. Stanley, Princeton, N. J.—p. 431.
Myotonia. A. Rabin, Denver.—p. 443.

Michigan State Medical Society Journal, Lansing

38: 1021-1138 (Dec.) 1939

Diagnosis and Treatment of Cholecystitis. R. D. McClure, Detroit.—p. 1035.
Flexible Gastroscope as Diagnostic Aid. D. J. Sandweiss, H. C. Saltzstein and M. H. Sugarman, Detroit.—p. 1044.
Cerebral Anoxia and Anesthesia. F. Schreiber, Detroit.—p. 1050.
Luetic Polyneuritis: Case History. A. Dubnove, Detroit.—p. 1056.
Survey of Iodized Salt Obtained, on Open Market, from Various Districts of State of Michigan, 1939. D. M. Cowie and J. J. Engelfried, Ann Arbor.—p. 1057.
Clinical Uses of Endometrial Biopsy. L. S. Griffith and W. P. L. McBride, Grand Rapids.—p. 1064.
Malignant Solitary Polyp of Sigmoid Colon Causing Intussusception: Case History. E. G. Krieg and W. S. Lovas, Detroit.—p. 1069.
Syphilis Control in Michigan and Our New Prenatal Law. Advisory Committee on Syphilis Control.—p. 1070.
Stored Blood Transfusion in a Relatively Small General Hospital. E. P. Vary and J. B. Krahl, Flint.—p. 1072.
*Bromide Intoxication. R. W. Waggoner and D. A. Boyd, Ann Arbor.—p. 1080.
Federal and State Cooperation in Maternal and Child Health. Katharine F. Lenroot, Washington, D. C.—p. 1088.
Occupational Hygiene in Michigan Sixty-Five Years Ago. C. P. McCord, Detroit.—p. 1094.

Bromide Intoxication.—Waggoner and Boyd recognize the beneficial effects of bromides, when correctly used, but they emphasize the equal potentiality for harm when they are given injudiciously. Even in suitable cases, after prolonged administration, the blood concentration may soon exceed the safe level of about 125 mg. per hundred cubic centimeters. The physician must carefully select cases for bromide administration and insist on an adequate fluid intake and sufficient chlorides (at least a daily dose of 15 Gm. of chlorides is necessary when the daily sodium bromide intake is 45 grains [3 Gm.]). As the patient may have already received large quantities of bromide from a previous physician or by self medication, these drugs should never be prescribed without careful inquiry into the history of medication and a chemical examination of the blood or urine. This can easily be done by the method of Belote. Small strips of filter paper are soaked in a saturated solution of fluorescein in 60 per cent acetic acid and allowed to dry. The suspected body fluid is placed in a test tube. To this are added a few crystals of potassium permanganate. After agitation, a few drops of concentrated sulfuric acid are added and the fluorescein paper is held, after moistening with 2 per cent acetic acid, at the mouth of the test tube. The presence of even minute amounts of bromine is at once indicated by a rapid change in color from the original yellow to a bright pink. If bromide is present, the blood concentration should be determined by the Hauptmann modification of Walters' method. If these precautionary measures are carefully observed, bromide therapy is valuable when mild sedation is necessary. Bromides accumulate quickly in the blood whenever the cardiovascular system is disordered and even small doses may cause a bromide intoxication. The increased restlessness and anxiety of these patients, which is due to beginning toxicity, is frequently misinterpreted as a continuation of the original nervous tensional state and the medication is maintained with the ultimate production of severe intoxication. Individuals with mild mental disorders, organic brain syndromes or basically neurotic personalities, that is low psychic reserve, must be considered as already in precarious balance, and potentially intoxicating drugs such as bromides should be used with great caution.

Minnesota Medicine, St. Paul

22: 807-888 (Dec.) 1939

Diagnosis of Virus Diseases. T. Francis Jr., New York.—p. 807.
*Rationale of Bile Salt Therapy in Biliary Tract Disease. A. C. Ivy and A. L. Berman, Chicago.—p. 815.
Scope of Surgery in Control of Pulmonary Tuberculosis. H. A. Carlson, Ah-Gwah-Ching.—p. 820.
Diagnosis and Treatment of Hemorrhagic Diathesis. C. H. Watkins, Rochester.—p. 824.
Recurrent Thyrotoxicosis After Thyroidectomy. O. J. Hagen, Moorhead.—p. 828.
Pelvic Pain. W. A. Coventry, Duluth.—p. 832.

Bile Salt and Biliary Disease.—Ivy and Berman list the activities of bile salts in the economy of the body. They promote the formation of bile, keep fatty acids in solution, aid in the digestion and absorption of fats, facilitate the absorption of iron and calcium, have a laxative action, take an important part in detoxifying bacterial toxins in the intestinal tract, when bile salts are being secreted liver glycogen is diminished and they favorably influence the bile-salt-cholesterol ratio. In the absence of bile salts in the intestine the oral administration of bile salts is indicated to improve digestion and absorption. The role of bile salts in the absorption of vitamins D and K and fats is alone a sufficient indication. The presence of bile pigment in the feces does not necessarily indicate that bile salt is being secreted in the bile. The liver may excrete pigment when it does not form and secrete bile salts. Frequently in biliary tract disease, in the absence of total obstruction, sufficient hepatitis may be present to diminish bile salt synthesis markedly but not to prevent bile pigment excretion. In biliary tract disease without acute hepatitis, bile salts should be administered to flush the biliary passages with a copious flow of low viscosity. Bile salts can be used with the hope of counteracting a tendency toward stasis and its effects and in this way produce and maintain a copious flow of bile through the biliary passages. However, to obtain this effect the patient must have a liver that will secrete bile salts. A brisk flow of fluid through the hepatic ducts tends to prevent ascending infection. Since bile salts are laxative, a lack of bile salts would increase the tendency toward constipation and the increase in constipation would further affect the liver and sphincter, thus possibly setting up a vicious circle that is broken best by the oral administration of bile salts. To what extent the administration of bile salts will change the chemistry of the bile in the gallbladder and will flush out the gallbladder is uncertain. It is possible that "flushing" or a "washing out" of the gallbladder might be obtained by giving bile salts and then fat to empty the gallbladder, repeating the procedure three or four times a day. The authors doubt the wisdom of bile salt therapy in the presence of biliary tract disease and acute hepatitis, except for the purpose of improving intestinal absorption. It is a scientifically directed procedure only when the liver and biliary tract of the patient are proved to be functioning abnormally and bile salt substitution or additive therapy is necessary to aid in correcting the disturbance.

New England Journal of Medicine, Boston

221: 883-920 (Dec. 7) 1939

Physical Examination of Groups. R. W. Buck, Boston.—p. 883.
*Drug Therapy in Cases of Infantile Cerebral Palsy and Allied Disorders, with Special Reference to Hyoscine. I. C. Nichols, Providence, R. I., and S. R. Warson, New Haven, Conn.—p. 888.
Comparison of Davies-Hinton and Wassermann Reactions in Cerebrospinal Fluid. C. Brenner and H. H. Merritt, Boston.—p. 891.
Inadequacy of Injection Treatment of Hernias. R. Slater, Boston.—p. 895.

Drug Therapy in Infantile Cerebral Palsy.—In treating patients with infantile cerebral palsy, Nichols and Warson carried out a program of training including hydrotherapy, massage and active and passive exercise. In considering a pharmacologic approach also the hypothesis was advanced that treatment with a drug in the atropine group might reduce the hypertonus, influence the athetosis, speed up the process of training and eliminate the drooling. The drug of choice was scopolamine hydrobromide, which they administered in six cases, with minor interruptions, for two and a half years. The usual maintenance dose was $\frac{1}{100}$ grain (0.0003 Gm.) given twice daily by mouth. There was no change in the treatment program other than the addition of the drug therapy. During the course of this study the scopolamine was discontinued and the effects of three

other drugs, phenobarbital, amphetamine (benzedrine) sulfate and atropine, were tested over two week periods. The authors found that under scopolamine therapy drooling was abolished in all cases, the athetosis was lessened, confidence was increased, relaxation improved and progress in retraining was more rapid. One child learned to walk in three days. No general contraindications to scopolamine were established. In particular there were no increasing tolerance, no annoying side effects and no untoward symptoms even when the drug was suddenly withdrawn after periods as long as nine months. The favorable response to scopolamine came early or not at all. Amphetamine sulfate, phenobarbital and atropine sulfate, which were investigated clinically in the same series, proved disappointing.

221: 921-958 (Dec. 14) 1939

- Riboflavin Deficiency in Man. N. Jolliffe, H. D. Fein and L. A. Rosenblum, New York.—p. 921.
Etiology and Pathogenesis of Thyrotoxicosis, with Special Reference to Its Pituitary Origin. A. W. Elmer, Lwów, Poland.—p. 927.
*Pinworms and Appendicitis. T. W. Botsford, H. W. Hudson Jr. and J. W. Chamberlain, Boston.—p. 933.
Rocky Mountain Spotted Fever: Case Report. N. A. Welch and P. J. Jakmauh, Boston.—p. 937.
Vascular Diseases, with Particular Reference to Arterial Hypertension. S. Weiss, Boston.—p. 939.

Pinworms and Appendicitis.—Botsford and his associates say that seventy-one of 1,343 appendixes removed at the Children's Hospital, Boston, from 1929 to 1939 were infested with pinworms. They resorted to microscopic search as well as to gross inspection. The incidence of appendixes containing pinworms would be higher if such a procedure was followed in a routine manner in other hospitals, as this figure has more than doubled at this hospital since microscopic examination was included. Twenty-six patients had acute appendicitis and pinworm infestation. The cases differed in no way from the usual picture of acute appendicitis in children. Forty-five patients had no inflammatory change in the appendix but had pinworm infestation. All had abdominal pain and all were relieved by appendectomy. Twenty-nine of the thirty patients who had chronic abdominal pain were relieved by appendectomy. Twenty-two patients who had no microscopic evidence of appendicitis but had pinworm infestation of the appendix presented a syndrome exactly like that of acute appendicitis. Pinworm infestation of the appendix cannot be differentiated with certainty from acute appendicitis. It may be suggested by a history of pinworm infestation and recurrent abdominal pain. The mechanism of the mode of action of pinworms in the appendix is unknown. The safest treatment of appendical symptoms due to pinworms is appendectomy.

Oklahoma State Medical Assn. Journal, McAlester

32: 433-466 (Dec.) 1939

- Present Status of Active Immunization in Prevention of Disease. J. A. Kolmer, Philadelphia.—p. 433.
The Private Physician's Part in a Public Health Program. J. C. Rose, Oklahoma City.—p. 441.
Thiocyanates in Treatment of Hypertension. W. T. Bynum, Chickasha.—p. 444.
Cortical Hormone in Treatment of Bromide Intoxication. C. H. Campbell, Oklahoma City.—p. 447.
Routine Laboratory Examinations for Typhoid Fever and Dysentery Organisms. W. D. Hayes and Rita Robinson, Oklahoma City.—p. 449.

Pennsylvania Medical Journal, Harrisburg

43: 209-400 (Dec.) 1939

- Prolapse of Uterus. J. L. Baer, Chicago.—p. 221.
Surgical Control of Hyperacidity. V. G. Burden, Philadelphia.—p. 227.
Surgeon's Place and Procedure in Peptic Ulcer. G. C. Engel, Philadelphia.—p. 231.
Treatment of Illness of Emotional Origin by the General Physician. E. Weiss, Philadelphia.—p. 239.
Frequent Nonulcerous Cause of Peptic Ulcer Syndrome. L. M. Morrison, W. A. Swalm and C. L. Jackson, Philadelphia.—p. 243.
*Treatment of Acne Vulgaris with Estrogenic Hormone: Clinical Investigation. L. Hollander and C. L. Schmitt, Pittsburgh.—p. 249.
Importance of Syphilis in Diagnosis and Treatment of Lesions of Nose and Sinuses. A. T. Smith, Philadelphia.—p. 252.
Conservation of America's Greatest Asset. J. M. Higgins, Sayre.—p. 256.
*Allergic Vertigo. L. H. Crip, Pittsburgh.—p. 258.

Treatment of Acne Vulgaris with Estrogen.—Hollander and Schmitt used emmenin (an estrogenic substance of placental origin) in the treatment of forty-one female and nineteen male patients with acne. The patients were from 14 to 25 years of

age and the duration of their acne ranged from two months to twelve years. No patient was under treatment less than three or more than twelve months. As the study was carried on over a period of two years, any improvement due to normal seasonal variation can be disregarded. The diet was not restricted, nor were any local medicaments used. In female patients the estrogenic medication was discontinued during each menstrual period. The forty patients who had no previous treatment and who were not markedly improved after estrogenic therapy received fractional doses of roentgen radiation, the application of a sulfur lotion and a dietary regimen. This was done in an attempt to ascertain if the previously given estrogenic substance might influence the effect of this routine therapy. Fourteen of the sixty patients showed a definitely good response to estrogenic therapy. Ten of these were female and four male. Five patients experienced moderate improvement, twenty-three slight improvement and the remainder were either slightly improved or made worse. Of the forty patients who were given further roentgen therapy, five were markedly improved, twenty-one moderately, eight slightly and six experienced no change. Improvement, if it occurred, always manifested itself by the end of the second month. Seven of the ten improved female patients had a definite association between the acne and the menstrual period. Only one of the fourteen patients who were definitely improved did not have an oily skin. Without exception the oiliness of the skin became much less during the estrogenic treatment. This decreased oiliness was also always observed on the scalp. After the medication was discontinued, eleven of the fourteen improved patients had relapses. The superficial papulocystic acne lesion on an oily skin was the type of lesion most constantly influenced by the estrogenic substance. The duration of the acne in the improved group varied from eighteen months to eleven years. Only one patient showed any untoward reaction: nausea. This patient later tolerated the drug very well. The only positive laboratory observation was a moderate degree of secondary anemia shown by seven of the patients. No patient who previously had normal menses experienced any irregularity, delay or dysmenorrhea of the menses. Two patients who had marked dysmenorrhea found that this symptom was much less severe when they were taking the estrogenic substance. However, a third patient was not helped. Six of the patients who previously had marked irregularity of the menses showed a tendency toward a regular cycle.

Allergic Vertigo.—Crip believes that the incidence of labyrinthine vertigo of allergic origin is greater than suspected. The pathologic physiology is in all likelihood an edema of the various structures of the internal ear. The symptoms depend on which of these structures is edematous. The diagnosis of allergic vertigo is based on the absence of other etiologic factors, the presence of a positive family history of allergy, the presence of associated allergic manifestations (asthma, hay fever, eczema and the like), a history of clinical sensitivity, the diagnosis of blood eosinophilia and positive cutaneous tests and/or the response to epinephrine therapy. Vertigo of allergic origin may occur either as a single isolated symptom or in conjunction with a series of other symptoms such as tinnitus, deafness and gastric manifestations. During the attack the patient may break out in a cold sweat. The attack may be preceded or accompanied by nausea and vomiting. Tinnitus may be unilateral or bilateral and is as a rule high pitched. The impairment in hearing is usually partial and temporary, returning to normal in the interval between attacks. Labyrinthine vertigo may result from causes other than allergy: infections, tumors, toxemia or hemorrhage in the internal ear or cerebral centers. The pathologic physiology of allergic headaches is thought to be that of an edema of the meninges. Many of these patients complain of severe dizziness coincident with the headaches. The vertigo of these patients may likewise be the result of an edematous process of the membranous labyrinth. Adequate treatment is predicated entirely on a correct diagnosis. After all possible causes of vertigo are eliminated, the patient should be subjected to an allergic study. Based on information elicited from such an investigation, suitable changes can be made in the patient's diet and environment. Hyposensitization, whenever indicated, is undertaken.

Philippine Islands Med. Association Journal, Manila

19: 603-652 (Oct.) 1939

- Unusual Types of Typhoid Infections: III. P. T. Lantin, N. Mendiola, S. Morales and M. Ramos, Manila.—p. 603.
- *Simple Serologic Test for Yaws and Syphilis Suitable for Provincial Hospitals and Field Dispensaries: Comparison with the Kahn and Wassermann Tests in Over 5,000 Cases. R. J. Navarro and F. Gomez, Manila.—p. 607.
- Local Observation on Use of Fresh Apple in Gastro-Enteritis. F. Z. Cruz, Manila.—p. 611.
- Observations on Sulfapyridine in Treatment of Pneumonias. L. B. Greentree, M. B. Lara, G. Peñalosa and L. Gallardo, Manapla, Occidental Negros.—p. 615.

Serologic Test for Yaws and Syphilis.—The serologic test for yaws and syphilis that Navarro and Gomez discuss was described by Cassili in 1936 and an abstract of his article appeared in *THE JOURNAL*, Oct. 24, 1936, page 1417. The authors present more comparative studies to establish the reliability of the test both as to sensitivity and as to specificity. They used this simple slide test and compared its results with the Kahn and Wassermann tests on 5,390 samples of serum. There was an agreement of 94.8 per cent of all three tests. This test and the Kahn test showed a 1.63 per cent disagreement. With the Wassermann test there was a disagreement of 4.34 per cent. The authors recommend the test as a routine serum diagnostic test for syphilis and yaws, especially in the provincial hospitals and field dispensaries in which well trained technicians and necessary apparatus for other tests are not available. It is further recommended that doubtful or weakly positive results be checked with either the Kahn or the Wassermann test or both whenever possible.

Review of Gastroenterology, New York

6: 454-557 (Nov.-Dec.) 1939

- Responsibility of the Gastro-Enterologist for the Psychoneurotic Patient. G. C. Robinson and M. Paulson, Baltimore.—p. 454.
- Angiofibrosarcoma of Stomach of Seventeen Years' Duration. R. B. Phillips and A. B. Rivers, Rochester, Minn.—p. 468.
- Present Status of Chronic Gastritis. I. R. Jankelson and C. W. McClure, Boston.—p. 473.
- Therapy of Colon Stasis. B. Fantus, Chicago.—p. 476.
- Gastrointestinal Tuberculosis: Correlation of Clinical Diagnoses and Autopsy Findings in Eighty Cases with Review of Literature. E. B. Freilich, G. C. Coe and N. A. Wien, Chicago.—p. 483.
- *When Is a Peptic Ulcer Healed? S. L. Cash, New York.—p. 491.
- Treatment of Cardiospasm Illustrating New Cardiospasm Dilator and Bisected Esophageal Tube. M. Einhorn, New York.—p. 499.
- Perirectal and Perianal Infection as Related to Pruritus Ani. R. J. Connors, New York.—p. 511.
- Role of Giardia in Gastrointestinal Symptoms. Mary M. Spears, Philadelphia.—p. 512.
- Gastroscopic Observations in Gastric Cancer. H. R. Liebowitz, Brooklyn.—p. 516.
- Primary and Recurrent Obstruction of Common Duct. M. Behrend, Philadelphia.—p. 526.
- Evaluation of Bile Salts in Biliary Disease. R. Upham and M. Hyman, New York.—p. 532.
- Cholecystography in Jaundiced Patient. M. Feldman, Baltimore.—p. 537.

The Healing of Peptic Ulcer.—Cash stresses the fact that, regardless of the method of treatment applied in a given case of peptic ulcer, proof of healing or lack of it is essential. Few ulcers are treated in the early stage and the chronic ulcer with the consequent pathologic changes makes healing more difficult and, even when obtained, permits defects to remain that induce recurrence. That peptic ulcer can be healed is a proved fact. Some ulcers heal without treatment. Many can be cured with diet, rest and medication. The prevalence of ulcers that have undergone repeated courses of treatment without improvement or have reactivated after a period of quiescence is evidence of possible weakness in some phase of treatment. Expectancy in the probable rate of healing of an ulcer with or without slough and exudate has no fixed rule. The majority of active ulcers tend to heal readily, especially gastric; also some duodenal ulcers react to treatment with equal facility. Large active chronic ulcers usually react to direct treatment and heal readily, while the small shallow type often persist, and this type is frequently encountered in the chronic ulcer patient who has suffered varied experiences. Delay occurs more often with the ambulatory patient and is apparently due to excess food with resulting increased gastric secretion and traumatism. Proof for this statement is that, when treatment of similar cases is given in bed, healing occurs in normal time. A braid stain, after disappearance of free blood, exudate and even the crater, indicates that either unhealed scar tissue persists or that a turgescient pylorus with probable hypertrophy is present, or that the gallbladder is

involved or that a severe form of duodenitis may be the source of the persistent braid stain. Location of the stain in relation to pyloric constriction of the braid and the degree of braid constriction will aid in determining where the pylorus is hypertrophied and persistently spastic. When a positive braid stain is obtained before treatment and both tube returns (the procedure of removing slough, exudate and blood from the crater with the use of a tube with fenestrations which are brought in contact with the lesion by measurement taken from the positive test braid) and the x-ray examination are negative, careful study of the case will be required. A positive test braid alone or with tube returns, following surgical closure of a perforated ulcer, indicates an unhealed condition. Proved healing, if followed by recurrence, aids in deciding the need for surgery. In suspected cancer of the stomach or when ulcers have doubtful cancer features, progressive and proved healing exclude such a possibility. After proved healing of a peptic ulcer, digestive symptoms may continue or more likely recur. Hyperacidity, supersecretion, gastritis, duodenitis, pyloric involvement, chronic appendicitis, cholecystitis, gastric hyperesthesia, disease of the colon, adhesions, chronic partial duodenal obstruction, gastroenteroptosis, poor dietetic hygiene, vicious habits, use of alcohol and tobacco are frequently associated with peptic ulcer and may remain and cause symptoms.

Texas State Journal of Medicine, Fort Worth

35: 521-594 (Dec.) 1939

- Roentgen Diagnosis of Small Intestinal Lesions. E. P. Pendergrass, Philadelphia.—p. 528.
- Review of 4,000 Consecutive Deliveries in Baylor Outpatient and Hospital Service. C. R. Hannah and F. J. Sebastian, Dallas.—p. 535.
- Management of Intractable Pelvic Pain. W. R. Cooke, Galveston.—p. 540.
- Danger Points in Thyroid Surgery. A. L. Ridings, Sherman.—p. 544.
- Medical Management of Essential Hypertension. J. M. Horn, Fort Worth.—p. 549.
- Nature and Practical Value of Complement Fixation Test for Amebiasis. C. F. Craig, San Antonio.—p. 554.
- Radical Mastoid Operation: Its Indications and Technic. L. Daily, Houston.—p. 560.
- Infected Radicular Cyst of Antrum as Etiologic Factor in Eye Disease. C. P. Schenck, Fort Worth.—p. 567.
- Sewage Irrigation. V. M. Ehlers, Austin.—p. 570.

Virginia Medical Monthly, Richmond

66: 707-766 (Dec.) 1939

- Treatment of Parkinsonism with Preparation of Belladonna Root: Preliminary Report. R. F. Gayle Jr., Richmond.—p. 707.
- Fistulizing Cicatrices and Prolapse of Iris Following Imperfect Healing of Incision for Extraction of Cataract. D. B. Kirby, New York.—p. 711.
- Many-Sided Problem Presented by Fibroid Tumors. W. L. Peple, Richmond.—p. 716.
- Anxiety Neuroses. R. S. Cohen, Washington, D. C.—p. 719.
- Euthanasia. W. M. Bowman, Petersburg.—p. 723.
- The Premature Infant. W. F. Burdick, Washington, D. C.—p. 729.
- Relation of State Hospitals to Outpatient Clinics for Mental Diseases. H. C. Henry, Richmond.—p. 731.
- Report of 500 Cases of Varicose Veins: Injection Treatment With and Without Ligation. J. T. N. McCastor and Mary Cousins McCastor, New York.—p. 735.
- Paroxysm. Report of Case in a Child 4 Years Old. J. T. Newport News.—p. 737.
- Jaundice. Case Report. F. Kimmelstiel and N. Bloom, Richmond.—p. 740.
- Paget's Disease of Bone in the Field of Otolaryngology. G. B. Trible, Washington, D. C.—p. 742.
- The Socialization of Children. J. N. Williams, Richmond.—p. 747.

Yale Journal of Biology and Medicine, New Haven

12: 123-242 (Dec.) 1939

- Nathan Smith and Cancer Therapy. A. W. Oughterson, New Haven, Conn.—p. 123.
- Growth of Genital Tissues in Response to Estrone as Studied by Colchicine Technic. R. V. Worthington and E. Allen, New Haven, Conn.—p. 137.
- Use of Friedman Test for Pregnancy with Chimpanzees. J. H. Elder, Madison, Wis., and J. M. Bruhn, University, Ala.—p. 155.
- Experimental Modification of Polarity Potential of Human Eye. W. R. Miles, New Haven, Conn.—p. 161.
- Experimental Tuberculosis in Mice: Cellular Response to Chemical Fractions of Tubercle Bacillus. R. M. Thomas and F. I. Dessau, New Haven, Conn.—p. 185.
- Vocationalism in the University. H. S. Burr, New Haven, Conn.—p. 199.
- Vitamin Deficiencies and Nervous System: Consideration of Contributions of Animal Experimentation. G. R. Cowgill, New Haven, Conn.—p. 205.
- Malignant and Nonmalignant Uterine and Vaginal Lesions in Mice Receiving Estrogens and Estrogens and Androgens Simultaneously. W. U. Gardner and E. Allen, New Haven, Conn.—p. 213.
- Clinical Use of Stilbestrol, a Synthetic Estrogen: Preliminary Report. R. M. Lewis, New Haven, Conn.—p. 235.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 1073-1126 (Dec. 2) 1939

Treatment of War Fractures by Closed Method. J. Trueta.—p. 1073.
Anesthesia in War Time. R. R. Macintosh and Freda B. Pratt.—p. 1077.

*Relapses After Sulfonamide Cure of Gonorrhea. A. J. Cokkinis and G. L. M. McElligott.—p. 1080.

Medical Research Council Blood Transfusion Outfit, as Provided for Sectors and Depots in London and Home Counties. Janet M. Vaughan.—p. 1084.

Barrel Bandage for Fractures of Jaw. W. K. Fry.—p. 1086.

Hemolytic Streptococcus Epidemic in a Hostel. Nesta H. Wells.—p. 1086.

Relapses After Sulfonamide Treatment of Gonorrhea.

—Cokkinis and McElligott find that late relapses of gonorrhea after apparent complete cure with sulfonamide derivatives occur frequently. They studied the records of more than 1,200 male and 200 female patients treated with sulfonamide compounds from six months to two years previously. The analysis reveals an incidence of late relapses sufficient to render unreliable any statistics of results based on a relatively short follow-up. The term "late relapse" is used when symptoms return three weeks or more after a successful sulfonamide course and after at least one negative series of tests. Of the total 1,268 male cases of gonorrhea treated, 263 either failed to respond to the treatment or were not seen again before tests of cure were carried out. Of the remaining 1,005 patients who remained well more than three weeks after their last sulfonamide course and who passed one or more series of tests of cure, 118 (12 per cent) have returned with late relapses (112 with one relapse, five with two and one with three relapses). This 12 per cent is not an accurate estimate of the true relapse rate, as a large number of the 1,005 patients defaulted during the follow-up, and some of these must have relapsed subsequently. The 118 relapses are in the authors' opinion all genuine relapses. Another 100 of the 1,005 patients also returned with gonorrhea in the same period: of these, eighty-seven had definite reinfections, while the other thirteen might have had relapses or reinfections. A special analysis of the material shows that: 1. The incidence of late relapses does not vary with the individual sulfonamide derivatives. 2. There is a fall in both early and late relapses when the chemotherapy is delayed until after the first week of symptoms, definitely so in the sulfanilamide treated group. 3. Adjuvant treatment (vaccine) appears to decrease the relapse rate. 4. Apparent rapid cure does not decrease the incidence of relapse. 5. As patients with relapses are more likely to return at a late stage of the follow-up than unrelapsed ones, it is likely that in actual fact there is a gradual fall in the chance of relapse with the passage of time. 6. Gonococci were present in 81 per cent of late relapses treated in the first two weeks of gonorrhea and in 36 per cent of those treated at a more chronic stage. These figures are based mainly on the results of smear examinations. The use of culture studies may have shown gonococci in many more instances of negative urethral or prostatic smears. 7. The many late relapses throw considerable doubt on the reliability of provocative and other tests of cure in cases treated by chemotherapy. The fact that relapse occurred in 118 of their cases after successful passing of at least one series of tests (seventy-one of them passed two or more) indicates that negative tests are not proofs of cure in cases treated by chemotherapy. And yet the fact that 20 per cent of the late relapses were definitely provoked by vaccine, bougie or alcohol from three to six months after apparent complete cure shows that these tests are still of value but that great caution should be exercised in their interpretation. The authors stress the value of repeated examinations (including culture) of the prostatic secretion, as they believe that many postsulfonamide relapses are started by gonococci in the prostate which were rendered only temporarily inactive. A negative gonococcus complement fixation test does not always mean that a patient is cured. Sixteen of the 210 women with gonorrhea had late relapses. On the whole the figures for them are a little more encouraging than those for the men.

Edinburgh Medical Journal

46: 733-828 (Dec.) 1939

Metabolism of Heart. C. A. L. Evans.—p. 733.

Acute Abdomen in Childhood. Gertrude Herzfeld.—p. 750.

Recent Developments in Surgery of Obstructive Jaundice, with Special Reference to Risk of Hemorrhage. C. F. W. Illingworth.—p. 762.

Cancer and Its Biochemical Factors. M. Copisarow.—p. 781.

Lancet, London

2: 1157-1204 (Dec. 2) 1939

*Vitamin K Lack in Normal and Sick Infants. H. Dam, E. Tage-Hansen and P. Plum.—p. 1157.

*Nutritional Deficiency of Vitamin K in Man. R. Kark and E. L. Lozner.—p. 1162.

Some Fractures of the Skull. J. H. Pringle.—p. 1164.

*Intravenous Injection of Sodium Salts in Sciatica. H. B. Sutton.—p. 1168.

Changes in Stored Blood. A. Macdonald and G. M. Stephen.—p. 1169.
Unilateral Hereditary Deafness. A. B. Smith.—p. 1172.

Lack of Vitamin K in Infants.—Dam and his associates examined the prothrombin in infants suffering from icterus gravis, hemorrhagic state, and anemia, erythroblastosis and hydrops congenitus. In all a pronounced reduction of prothrombin was found. These cases were compared with a number of normal infants with and without "physiologic" icterus neonatorum. The authors summarize their studies as follows: In normal infants a moderate lack of vitamin K develops during the first few days after birth and disappears within a week. This results in a hypoprothrombinemia, which is the cause of the commonly seen slight hemorrhagic diathesis in the newborn. Its cause must be insufficient supply of vitamin K from the intestine. In diseases belonging to the clinical triad of icterus gravis neonatorum, anemia neonatorum and hydrops congenitus, a considerable hypoprothrombinemia has been demonstrated. Ingestion of vitamin K (together with bile salt) by one of the patients resulted in a rapid increase in prothrombin; one may therefore presume that the hypothrombinemia in this case was due to lack of vitamin K. In cases in which a complete lack of prothrombin is seen one day after birth, other causes than insufficient absorption from the intestine must be operating.

Nutritional Deficiency of Vitamin K in Man.—Kark and Lozner report observations on four patients with known deficiency disease of nutritional origin in whom diminished prothrombin levels were incidentally discovered. All four patients had lived alone and had subsisted on diets deficient in fruits and green vegetables. There was no jaundice, but the prothrombin time was found to be prolonged. The patients were each given eight capsules of vitamin K without bile salts by mouth. Each capsule contained 37,500 Dam units. Twenty-four hours after the start of administration of vitamin K the prothrombin time in each case was essentially normal. During the next two days vitamin K was given in the same dosage and after this the prothrombin times were still normal and remained so during the next month, while the patients continued to take the deficient diet without additional vitamin K. Vitamin C therapy was instituted in case 1 after the initial prothrombin observation. Ascorbic acid in a dose of 400 cc. was given daily by mouth, and three days later the vitamin C level of her plasma had risen from 0 to 0.42 mg. per hundred cubic centimeters. At this time a second observation of the prothrombin time was made and this was still greatly prolonged. In cases 2 and 3 treatment with ascorbic acid was not given during the period of observation, and the plasma vitamin C remained at 0. From the foregoing observations it appears that no correlation exists between vitamin C therapy or its level in the plasma and the prothrombin times. The origin of the prothrombin deficiency in these cases cannot be related to biliary obstruction, to biliary fistula or apparently to liver disease. In each case the icteric index, blood fibrinogen and daily urinary urobilinogen were within normal limits. The four cases reported have two noteworthy features: the history of dietary deficiency with the development of scurvy in three and of pellagra and subclinical scurvy in one, and evidence of a prothrombin deficiency which responded to oral vitamin K therapy without bile salts. The evidence seems to point to a

nutritional deficiency of vitamin K as the etiologic basis of the prolonged prothrombin times. None of these patients, however, showed the extreme diminution of prothrombin which has been described in prolonged obstructive jaundice. In view of the fact that the hemorrhagic diathesis associated with prolonged obstructive jaundice develops only when the prothrombin time is considerably longer than in these four cases, it seems doubtful that the prothrombin decrease was the cause of the hemorrhagic manifestations in these cases, for the hemorrhages were classic scurvy and no ascorbic acid was found in the blood plasma. These observations offer further evidence that nutritional deficiency in man is rarely, if ever, confined to a single factor.

Injection of Sodium Salts in Sciatica.—Sutton says that this investigation was instigated by a report which Porter made in 1925. The treatment consists of the administration of both sodium salicylate and sodium iodide in a single solution by intravenous injection. Each injection consisted of 20 cc. of an aqueous solution containing 1 Gm. of sodium salicylate and 1 Gm. of sodium iodide. The solution was prepared as follows: The sodium salts were dissolved in previously sterilized and twice distilled water without warming. The solution was filtered through a Jena glass bowl and put up in 20 cc. sterile ampules, which were quickly sealed, care being taken that the solution did not become too hot. Sterility was further insured by heating to 70 C. for an hour on three consecutive days. The solution is readily decomposed by heat over 80 C. and by light. The ampules were of plain (not colored) glass, so that any subsequent decomposition of the solution would be readily detected. Prepared in this way the solution remains clear for three months or longer. The injections were made slowly with an ordinary 20 cc. record syringe. Any inadvertent injection into the tissues causes great pain, without, however, any subsequent sloughing. The author resorted to this treatment in thirty-two cases of sciatica, of which twenty were primary and twelve secondary. In the twenty cases of primary sciatica, pain ceased usually after about ten minutes. If a second injection was necessary the result was better than that of the first injection. In the twelve cases of secondary sciatica due to some extraneous pathologic condition, pain was diminished but not abolished and a second injection tended to produce less effect than did the first. Any improvement in secondary sciatica is probably due to the analgesic action of the sodium salicylate, but in primary sciatica, in all likelihood "rheumatic," the effect of the sodium salicylate appears to be specific rather than symptomatic. The cases treated this way are too few to justify definite conclusions; nevertheless the intravenous injection of sodium salicylate and sodium iodide does rapidly cure uncomplicated cases of sciatica; on the other hand, its lack of effect on secondary sciatica suggests its value in diagnosis.

Medical Journal of Australia, Sydney

2: 819-852 (Dec. 2) 1939

- Thyrotrophic Hormone and Its Relation to Clinical Syndromes. C. G. Lambie.—p. 819.
Osteitis Fibrosa Cystica Generalisata and Parathyroid Tumor. J. F. Hughes.—p. 830.

2: 853-886 (Dec. 9) 1939

- Thyrotrophic Hormone and Its Relation to Clinical Syndromes. C. G. Lambie.—p. 853.
The "Acute Appendix." L. H. Ball.—p. 869.

Practitioner, London

143: 573-668 (Dec.) 1939

- Diagnostic Importance of Tongue. A. M. Kennedy.—p. 573.
Malignant Disease of Lips and Mouth. E. R. Carling.—p. 584.
Dental Aspects of Disorders of Mouth. A. T. Pitts.—p. 596.
Treatment of Stomatitis. J. Craig.—p. 607.
Disorders of Skin in Neighborhood of Lips and Mouth. P. B. Mumford.—p. 612.
Neuroses of Noncombatants in Time of War. H. Crichton-Miller.—p. 618.
Psychologic Factor in Rheumatic Disease. H. G. McGregor.—p. 627.
Prognosis in Detachment of Retina. S. Philips.—p. 637.
Painless Dissecting Aneurysm of Aorta. J. B. Jessiman.—p. 643.
Psittacosis as Cause of Obscure Fever. F. D. M. Livingstone.—p. 647.
Modern Therapeutics: VI. Iodine and Iodides. H. K. Goadby.—p. 650.

Archives de Médecine des Enfants, Paris

42: 609-672 (Oct.) 1939

- Infantile Pseudoparalysis. L. Babonneix.—p. 609.
Meningeal Manifestations and Cases of Meningitis Caused by Paratyphoid or Eberth's Bacilli. N. Facatselli.—p. 615.
Complications Following Erythema Nodosum in Children. F. Tissot.—p. 627.

Complications Following Erythema Nodosum in Children.—Tissot calls attention to possible complications following erythema nodosum in children. Visceral tuberculous manifestations, such as serofibrinous pleurisy, perihilar and peritoneal irritation, and lobular and perilobular inflammation, occurred in the majority of the twenty cases observed by the author, nine of serious character. Most of these manifestations occurred in the months following the cutaneous incident. For prophylactic measure the author recommends staying home for from six to eight weeks after the cutaneous eruption. If the patient's condition is satisfactory, living in the country or at medium altitude in a mild protected place is advised.

Presse Médicale, Paris

47: 1517-1532 (Nov. 18-22) 1939

- *1262 F. (Diethyl-Amino-Ethoxy-2-Diphenyl) in Treatment of Anginal Syndromes. A. Clerc and J. Sterne.—p. 1517.
Urinary Infection with Pyocyanic Bacilli. L. Strominger.—p. 1519.
Device for Injection of Conserved Blood. Jame and Grimberg.—p. 1521.

Treatment of Anginal Syndromes.—Clerc and Sterne direct attention to a group of chemical substances capable of influencing certain anginal crises. They cite studies on 1262 F, the diethyl-amino-ethoxy-2-diphenyl, in which remarkable efficacy is combined with relatively low toxicity. It unites the antifibrillatory properties of quinic substances and the beneficial effect of theophylline on the coronaries, but it does not have a depressive action on the heart. The diethyl-amino-ethoxy-2-diphenyl is administered by mouth. The individual dose is 0.05 Gm. and the daily dose amounts to from 0.15 to 0.2 Gm. It is well tolerated, even by subjects with severe cardiac and renal changes. It exerts a remarkable influence on the pains of the anginal type. It proved effective in fourteen of nineteen cases of angina pectoris. Its action was especially favorable in the cases of angina pectoris in which severe electrocardiographic changes existed, which indicated coronary involvement. Doubtless the causal lesion is not removed, but its troublesome effects are attenuated or perhaps forestalled. The medication is purely symptomatic and the duration of the influence may vary. Generally the administration of the diethyl-amino-ethoxy-2-diphenyl must be continued for several months; the doses are gradually reduced until they are stabilized at about 0.1 Gm. a day. Three times it was possible to interrupt the treatment without reappearance of the attacks. Some patients were treated in this manner for from six months to a year. Four times, on the other hand, the efficacy became exhausted, after having been highly satisfactory at first; the attack recurred at the end of several weeks. To avoid this, it has been suggested that the treatment be administered in series of increasing and decreasing doses and if possible with interruptions. Even if the medication is continued for more than a year, harmful effects are absent.

Archiv für klinische Chirurgie, Berlin

197: 1-318 (Oct. 12) 1939. Partial Index

- Pyloric Hypertrophy of Adults and Antrum Carcinoma. H. Priez.—p. 1.
Fractures of Caputulum Radii. E. Bürmann.—p. 115.
Synovial Sarco-Endothelioma of the Hip Joint. F. Klages.—p. 137.
Postoperative Hematogenous Peritonitis. L. von Gidró.—p. 147.
Permeability of Intestinal Wall for Bacteria, Especially in Presence of Circulatory Damage to Colon. S. Hurya.—p. 211.
*Experimental Contribution to Epidural and Subdural Hematoma and Therapeutic Value of Dehydration and Repeated Cisternal Puncture. Y. Kabuki.—p. 230.

Epidural and Subdural Hematoma.—Kabuki observed the clinical course and the microscopic appearances of epidural and subdural hematomas which he had produced in dogs for from three to 120 days. The organization of the hematoma of either type takes place from the dural side several days after the operation and is completed in from fourteen to twenty days. Organization of the blood in the case of the subdural hematoma proceeds from the dura alone without the participation of the pia or the arachnoid, whereas in the case of the epidural hematoma in addition to the proliferation from the dura one finds

endothelial cells and various cells proliferating from the bony surface. The author observed the formation of the membrane lined with a thin layer of cells of mesothelial type and considered by many authors to be characteristic for the subdural hematoma, in both the subdural and the epidural variety. Along with the formation of new capillaries, he had observed spaces lined with endothelial cells. These were lined in the early stages with a layer of interlacing fibers but no fibroblasts. The author considered these spaces as blood spaces analogous to formation of new capillaries. Foci of calcification were observed in microscopic preparations from ten to twenty-four days old. Dehydration therapy practiced in one group of these dogs had no effect on the organization of the hematoma. In some of these animals the loss of fluid caused, in addition to shrinking of the brain tissue, alterations suggestive of a beginning degeneration of the ganglionic cells. Organization of the blood began sooner and was completed more promptly in the series in which repeated cisternal punctures were practiced. Among the clinical manifestations the author emphasizes conjunctival hemorrhage, which made its appearance on the first postoperative day, as a rule, and which disappeared by the seventh to tenth day. This symptom had not been previously mentioned. The cerebrospinal fluid showed distinct differences in the two types of hematoma. There was only a mild increase in the cell count, and this soon returned to normal, and no other pathologic observations in the epidural type, while in the subdural the cerebrospinal fluid was distinctly hemorrhagic. Xanthochromia and a positive Nonne-Appelt reaction were present and the increased cell count persisted for as long as two weeks. The animals exhibited clonic spasms, convulsions and pareses of the lower extremity of the corresponding side, as a rule. Secondary bleeding was not unusual and took place, as a rule, between the dura and the hematoma, in one case thirty days after the operation. The organization process of both types of hematoma is typical. It consists of proliferation of spindle-shaped reticulum cells which form interlacing connective tissue fibers.

Monatsschrift für Kinderheilkunde, Berlin

80: 137-272 (Oct. 12) 1939. Partial Index

- Pathogenesis and Differential Diagnosis of Pachymeningitis and Leptomeningitis Haemorrhagica Interna. W. Catel.—p. 137.
*Investigations on Calcium and Phosphorus Content of Raw and Heated Breast and Cow's Milk and of Their Ultrafiltrates. L. Weingärtner.—p. 157.
Gonorrheal Polyarthritits in Boy Aged 8 Months as Complication of Blood Transfusion. A. Iancu, C. Oprisiu and N. Domincovici.—p. 166.
Interstitial Nephritis in Scarlet Fever. S. Roufogalis.—p. 174.
Evaluation of Cutaneous Revaccination. D. Gyüre.—p. 197.

Phosphorus Content of Raw and Heated Milk.—Weingärtner points out that Catel had demonstrated in experiments on goats that feeding with heated homogeneous milk results in disturbances in the mineral metabolism. The question arose as to what factors are involved in this metabolic alteration that is produced by heating the milk. Since according to some investigators it is the ultrafiltrable portion of phosphorus and calcium that is absorbed and thus becomes important for the organism, the author decided to investigate whether this portion is reduced by the process of heating. The phosphorus and calcium content were determined in raw and in heated (three minutes at 100 C.) breast and cow's milk. Although it was realized that defatting of the milk involves a slight loss of phosphorus and calcium, the determinations were made on defatted milk in order to prevent a possible undesirable lipolysis and a stopping up of the filters with fat. The author found that the phosphorus content of the raw and heated cow's milk is approximately the same but that in heated breast milk it is 28 per cent lower than in raw breast milk. The decrease of phosphorus in the ultrafiltrate of heated breast milk in comparison with the phosphorus content of the ultrafiltrate of raw breast milk was 40.5 per cent. The decrease of phosphorus in the corresponding ultrafiltrate of cow's milk amounts to only 1.4 per cent. It is probable that the considerable decrease in the phosphorus content of the ultrafiltrate of heated breast milk is due to the fact that by the sterilization (heating) acid-soluble organic phosphorus is transformed into complex compounds and that a portion of the acid-soluble anorganic, ultrafiltrable phosphorus is transformed into colloidal compounds which do not pass the filter. The calcium content of

heated breast milk is reduced 19.3 per cent in comparison to that of raw breast milk. The decrease of calcium in the ultrafiltrate of heated in comparison to the calcium content of the ultrafiltrate of raw breast milk is only 0.84 per cent. The corresponding decreases in cow's milk amount to 0.5 and 0.4, respectively. The author concludes that the results of these investigations make understandable the disturbances in the mineral metabolism of prematurely born infants who are fed with sterilized breast milk.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

79: 2825-2888 (Nov. 7) 1939

- Evaluation of Data Obtained in Studies on Diets. II. Feeding Norms. I. H. G. Koefoed, S. Postmus and A. G. van Veen.—p. 2826.
*Frequency of Acute Appendicitis in Netherland East Indies. A. Fossen and H. E. Boeke.—p. 2857.
Frequent Occurrence of a Type of Trichostrongylus, Probably Trichostrongylus Colubriformis, in Intestine of Javanese. C. Bonne and L. K. Joe.—p. 2868.
Anthropologic Value of Fingerprints. J. Dankmeijer and R. C. Renes.—p. 2873.

Acute Appendicitis in Netherland East Indies.—Fossen and Boeke state that, from the first of March 1934 to the first of March 1939, 175 patients were treated for acute appendicitis in the Central Civil Hospital in Batavia. These 175 patients with appendicitis were observed among 13,000 patients; that is, the appendicitis cases amounted to 1.3 per cent of the total number. Among the 13,000 patients there were about 1,600 Europeans, 2,400 Chinese and 9,000 natives. The number of cases of appendicitis for these three racial groups were seventy-two, fifty and fifty-three, respectively. Thus the incidence of appendicitis among the Europeans was 4.5 per cent, among Chinese 2 per cent and among the natives only 0.6 per cent. However, the authors point out that anatomic pathologic studies on appendices of the different racial stocks have revealed that signs of inflammation occur in a large percentage of the appendices of natives as well as of Chinese; in fact, their morbidity is even higher than that of Europeans. Thus it seems that appendicitis is as frequent in the East Indies as in Europe, but it causes clinical manifestation much less frequently there than in Europe. Of the seventy-two Europeans who had appendicitis, forty-two were men and thirty were women; among the fifty Chinese, forty-five were men and five were women, and of the fifty-three natives, forty-eight were men and five were women. Thus among the natives and Chinese appendicitis is much less frequent in women than in men. Analyzing their cases according to age groups, the authors found that the incidence of appendicitis is highest in the age group between 20 and 30.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 5447-5522 (Nov. 18) 1939

- Herpes Corneae and Some Herpetiform Disorders of the Cornea. J. Goedbloed.—p. 5448.
Disturbances of Neurosympathetic Regulation. W. Smith.—p. 5456.
Encephalopathy Caused by Manganese. F. Grewel and E. Sassen.—p. 5464.
*Poisoning by Oil of Chenopodium. J. van Lookeren Campagne.—p. 5472.

Poisoning by Oil of Chenopodium.—Van Lookeren Campagne cites four cases of poisoning with chenopodium oil, all of which had a fatal outcome. In none of these cases had the anthelmintic been given on medical prescription. The author regards it as necessary that so dangerous a drug as chenopodium oil should be obtainable only on medical prescription and that great caution should be observed in its administration.

83: 5523-5614 (Nov. 25) 1939. Partial Index

- Contracted Pelvis in Practice. P. C. T. van der Hoeven.—p. 5524.
*Influence of Salyrgan on Volume of Blood. E. Lopes Cardozo.—p. 5528.
Physical Chemistry of Blood During Hypnotic Condition. A. Naerebout and B. Stokvis.—p. 5532.
Syndrome of Guillain-Barré (Polyradiculoneuritis with Albuminocytologic Dissociation). M. Hommes.—p. 5540.
Coccidioidomycosis. N. van der Walte.—p. 5548.

Influence of Salyrgan on Volume of Blood.—Lopes Cardozo made studies on patients with heart disease who, in spite of optimal treatment with digitalis, still had severe edema. He determined the volume of plasma by means of the blue dye-stuff T 1824 before the onset of the salyrgan treatment and after the edemas had disappeared, which required as a rule from seven to ten days, during which time the weight decreased by from 10 to 20 Kg. The author records observations on eight — 111:

He found that salyrgan treatment causes a reduction in the volume of blood. The diminution in the volume of plasma is accompanied by an almost parallel reduction in erythrocytes, so that the relative cell volume shows a tendency to remain normal. Even during salyrgan diuresis a gradually progressive reduction of the plasma volume has been observed. Probably this is in part responsible for the drop of the urea clearance that has been found during and shortly after salyrgan diuresis.

Acta Pædiatrica, Stockholm

26: 1-507 (Comp. Vol.) 1939. Partial Index

- Ten Years' Experience of BCG Vaccination at Gothenburg. H. Andersson and H. Belfrage.—p. 1.
A Few Words About So-Called Positive Anergy. G. Anzén.—p. 12.
Treatment of Pneumonia in Early Infancy. C. Friderichsen.—p. 167.
*Acute Polyarthrits as Initial Symptom of Primary Tuberculous Infection. J. Heimbeck.—p. 206.
Remarks on Physiologic Red Blood Picture During First Year of Life. Y. Åkerrén.—p. 502.

Acute Polyarthrits as Symptom of Tuberculosis.—Heimbeck reports the case of a woman aged 21 with tuberculous anamnesis in the father's family. The patient had been in good health until the sudden development of pain in the knees, left elbow, right hip and finger joints. The ankles, like the fingers, were swollen but not painful. Examination disclosed no abnormalities in the body, urine or temperature. Pirquet's test was tuberculin negative after forty-eight hours. Initial therapy before hospitalization consisted of rest and doses of acetylsalicylic acid. The pathologic condition evolved through an alternation of varying articular pains and their subsidence, in weekly intervals, with the sedimentation rate fluctuating accordingly. Another tuberculin test made six weeks after the initial appearance of the symptoms resulted in a maximal tuberculin positive reaction with vesicles. A roentgenogram taken on the same day failed to disclose the existence of a tuberculous lesion. The patient was kept in bed and managed with a combined arsenic and acetylsalicylic acid therapy. After a month (ten weeks after the appearance of the initial symptoms) a roentgenogram disclosed a clearly delimited compact infiltration the size of a small pea in the second intercostal space. A roentgenogram repeated two weeks later disclosed a right pleural effusion with no change in the infiltration. A further examination two months subsequently disclosed a diminution of the pleural effusion and incipient cicatrization of the pulmonary lesion. Control observations made about three and one-half months after this showed a physically normal condition and a pulmonary abnormality scarcely traceable in the roentgenogram. At no time were coughing and expectoration noted. The author regards the case as one of primary tuberculosis so recent in origin that neither the tuberculin test nor the roentgenogram indicated any abnormality until the infection had developed sufficiently. The diagnostic picture proceeded from a complete tuberculin anergy and negative x-ray evidence to a condition of maximal allergy within six weeks, with x-ray determination of the tuberculous focus as late as four weeks after this. Nonspecific articular abnormalities are not rare phenomena of tuberculous toxicity and have been variously interpreted in the literature. The new feature, according to the author, in this case is the appearance of initial articular symptoms in tuberculosis of a primary character. He thinks that specific primary toxins of tubercle bacilli may well exist in the absence of a tuberculin positive reaction. Experience with BCG vaccine therapy indicated to him that gross abscesses can exist months before cutaneous allergy can be demonstrated.

Acta Radiologica, Stockholm

20: 417-520 (Nov. 15) 1939. Partial Index

- Contribution to Knowledge of Primary Duodenal Cancer. Asta Bergendal.—p. 417.
*Insertion Pains Roentgenologically Diagnosed and Treated. S. Mustakallio and H. Laitinen.—p. 427.
Roentgenologic Examination of Acute Abdominal Lesions. J. Frimann-Dahl.—p. 438.
Deglutition Anomaly Simulating Hypopharyngeal Cancer. S. Welin.—p. 452.
Arteriographic Diagnosis of Malignant Glioma. H. Hemmingson.—p. 499.

Roentgen Therapy in Insertion Pains.—Mustakallio and Laitinen report excellent results obtained by roentgen treatments in forty-seven cases of rheumatic disorders at the insertion site, chiefly epicondylitis (twenty-one cases) and calcaneitis (twenty-one cases). The average age levels for both men and women

in epicondylitis were 44.8 and for calcaneitis 32.4. The average duration of illness before treatment was respectively six and seven months. All the cases of epicondylitis, with the exception of two, were lateral. Calcaneitis affected chiefly persons with flatfoot abnormality. Symptoms of epicondylitis consisted of actual pains, sensitivity to pressure, local swelling and pain on exertion, while patients with calcaneitis suffered pain in the standing or walking position. Both conditions caused partial incapacity for work. X-ray examination disclosed modifications consisting of small atrophic spots on the surface of the bone at the insertion site which gradually acquired uneven contours and showed small osseous spurs projecting in the direction of the tendon. Calcification in the vicinity of the insertion site was less frequent and apparently when it did occur was found in the tendon. In several cases x-ray examination showed that not only the bone at the insertion site but also the tendon terminating at the insertion site was affected, clear evidence of periosteotendinitis. X-ray examination of the heel bone disclosed periosteal changes consisting of spur formations at the tuber calcanei, which were manifestly of earlier origin, and of small atrophic spots such as rarely appear in normal conditions. Treatment consisted of single skin doses of from 100 to 150 roentgens applied twice at intervals of one or several days and was repeated, if necessary, every two weeks. Most cases promptly yielded to the first series of treatments and did not require further application. The patients were able to resume work after a few days. Subsequent inquiries extending over six months to six years, to which thirty persons responded, disclosed twenty-three cures (ten of the patients having been ill six months or longer before treatment), four improvements enabling work resumption, two relapses and one failure. According to the authors, insertion diseases merit greater attention because of the economic loss involved in inability to work. They stress the advantage of roentgen therapy over surgical intervention in painlessness, gain of time and economic saving. Operation consists of making a small incision in the insertion tendon of the lateral epicondyle and through immobilization effecting a cure, the procedure requiring about ten days.

Ugeskrift for Læger, Copenhagen

101: 1301-1330 (Nov. 9) 1939

- Mortality in Croupous Pneumonia. J. Møller.—p. 1301.
*Spondylarthrits Ankylopoietica: Remarks Concerning Early Diagnosis. N. Lassen.—p. 1307.
Spontaneous Hyperventilation Tetany: Description of Two Cases with Examination of Content of Calcium and Ionized Calcium in Blood Serum Outside of and During Attacks. P. Schultzer and H. Lebel.—p. 1312.

Spondylarthrits Ankylopoietica.—Lassen says that this disorder, which occurs chiefly in men, is now considered rheumatic. In spite of definite symptoms it is often not recognized until fairly late. There are inflammatory changes in the peri-articular connective tissue with growth of connective tissue into the small joints of the spinal column, with secondary calcifications after connective tissue ankylosis for a longer time. Corresponding changes take place in the sacro-iliac articulation. X-ray changes in the spinal column cannot be established until after three to five years, but changes in the sacro-iliac articulation are demonstrable in about a year. By x-ray examination of this articulation diagnosis can be made so early that an effective therapy can be introduced. Treatment consists of long continued physical therapy, warm baths of different kinds with light treatment and other strengthening and stimulating treatment, together with rest and massage. Under proper treatment the patient is able to work in spite of considerable ankylosis of the back, if greater deformities under development of the ankylosis can be prevented. The author reports that of seventeen patients (sixteen men, one woman) with spondylarthrits ankylopoietica treated in the last four years all but one admitted under various other diagnosis, physical therapy as indicated resulted in improvement in the ten. In six the symptoms had set in before the age of 20, in only one as late as at about 40. The average duration before diagnosis was about six years. In all cases there was pain in the legs, hips, loins and back and stiffness of the back; in six there was considerable anemia. The sedimentation reaction was pathologically increased in all cases. The general condition was affected in eleven.

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THE PATHOLOGY AND ROENTGENO- GRAPHIC MANIFESTATIONS OF PNEUMOCONIOSIS

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To the pathologists who coined it, the term pneumoconiosis was useful to describe all pulmonary reactions due to the inhalation of dust. Under the impetus of compensation laws this group of conditions has received so much attention that today pneumoconiosis is almost a household word. But too few are aware of its original significance and even some medical writers use it interchangeably with the specific term silicosis. As a pathologist I prefer to retain the original meaning and use pneumoconiosis as a generic term to describe all forms of pulmonary reactions to inhaled dust, with no implication as to character, severity or effect on function. The two clinically important forms of pneumoconiosis that are known as silicosis and asbestosis are respectively due to inhaled free silica and asbestos dusts. Other forms have been given special names to indicate the kind of mineral that produces them, but such terms have little practical significance because most pure substances other than free silica and asbestos cause little irritation and provoke essentially the same kind of tissue changes. Available information would make it more logical to classify most of the other known pneumoconioses in two general categories. Those which are characterized by appreciable degrees of fibrosis will yield free silica on analysis and hence should be designated as "modified silicosis." For the remainder I would suggest the name "benign nonspecific pneumoconiosis."

Illustrative of the latter are simple anthracosis and siderosis produced by inhaling relatively pure coal or iron dusts. By themselves these minerals provoke no significant fibrosis but merely pigmentation, which has no influence on pulmonary function. When they are mixed with free silica there is a fibrous reaction, but it is due to the contaminating silica. The resultant diseases are then more properly designated as anthracosilicosis and siderosilicosis.

Badham¹ suggested the term "silicatosis" to designate reaction to any silicate dust, but as there are hundreds of different silicates and only the fibrous varieties, collectively called asbestos, are known to provoke serious reaction his suggestion has not been generally adopted. In nature some silicates are commonly mixed

with quartz, but it is probably the latter which is responsible for pulmonary damage. Hence reactions to such dusts are properly designated as modified silicosis. Possibly other silicates whose effects have not yet been evaluated may subsequently prove to be dangerous in their own rights, but if they are it will not be because they are compounds of silicon but because of some special peculiarity of structure or composition.

In the temporary category are the pneumoconioses that are known chiefly from shadows cast on a roentgenogram. They may have a foundation of pathologic reaction, but it has not yet been adequately defined. However, the changes in the film are associated with so few authentic symptoms that their influence is viewed with skepticism. Here belong the so-called baritosis seen in men who are exposed to dust of barium sulfate and the false nodulation of arc welders. The former, described by Arrigoni,² may be nothing but the shadows of compact collections of radiopaque barium particles in the lungs. Likewise, Enzer's³ report of a single autopsy on an arc welder makes it seem probable that similar collections of iron particles rather than foci of fibrous reaction are responsible for the "nodular" shadows seen in occasional roentgenograms.

Finally there is the whole group of reactions to organic dusts that are properly included under the term pneumoconiosis. One form said to be due to cotton fiber has been named byssinosis but no good description of its pathologic manifestations can be found in the literature. In general it is assumed that most of the organic dusts may cause bronchitis with or without sensitization phenomena resulting in a variety of allergic symptoms. Moreover the reaction to dust composed of living organisms is in one sense a pneumoconiosis, but such conditions are generally classified as infections. They are beyond the scope of this paper. Likewise, definitely toxic dusts such as lead are excluded. Even without this group it will be appreciated that the term pneumoconiosis includes many different conditions and does not necessarily imply disabling disease of the lungs.

The first paper of the series¹ dealt with specific causes. It reviewed some of the complex factors which govern the behavior of fine mineral particles suspended in air and attempted to point out how they influenced the inhalation of dust. It discussed the varying capacities of different kinds of minerals to provoke reaction once they had accumulated in sufficient quantities within the lungs and indicated that some might inhibit the dangerous effects of free silica. It considered the influence of coexistent infection and the

From the Saranac Laboratory for the Study of Tuberculosis of the Edward L. Trudeau Foundation.

1. Badham, Charles: Notes on a Fine Type of Pneumoconiosis Produced by Silicates and Other Minerals, extract from the report of the Director General of Public Health, Year 1927 (New South Wales), Sydney, Australia, Government Printing Office, 1929.

2. Arrigoni, Arturo: Pneumoconiosis from Barium, *Med. d. lavoro*, 24: 461-468 (Dec.) 1933.

3. Enzer, N., and Sander, D. A.: Chronic Lung Changes in Electric Arc Welders, *J. Indust. Hyg. & Toxicol.* 20: 333-350 (May) 1938.

4. Gardner, L. U.: Etiology of Pneumoconiosis, *J. A. M. A.* 111: 1925-1936 (Nov. 19) 1938.

subject of individual susceptibility with a review of the factors proposed to explain this phenomenon.

The present paper will be concerned with the pathologic reactions to different minerals in normal and in infected human lungs. It will take up the evolution of the various disease processes and, when possible, describe the shadow pattern cast on roentgenograms of the lungs.

PROTECTIVE MECHANISMS

When one considers that in quiet respiration the average human being inhales some 12,000 liters of air every twenty-four hours and then recalls the varying degrees of atmospheric pollution created in our industrial civilization, it is apparent that the lungs must be protected against dust or they could not escape becoming clogged with foreign material. In all the higher animals, at least, two sets of mechanisms have developed designed to keep their lungs clean: one prevents dust particles from entering the lungs; the other removes the particles that elude the first barriers.

Dust particles are caught in the mucus secreted by the membrane lining all parts of the tract. Ciliary action then transports them to the nasopharynx, from which they are excreted.

Lehmann⁵ has suggested that such activities play only a minor role in the removal of dust in the nose and thinks that the shape of its cavities has much more effect. He has pointed out that the nasal passage consists of dilated anterior and posterior portions separated by a narrow constriction in the vicinity of the turbinates. He recalls that when dust-laden air is blown through a glass tube with a central constriction the particles all come to rest in the distal, dilated portion owing to the sudden cooling and expansion of the air. He believes that deformities due to faulty development, disease or injury change the shape of the nasal cavities and lower their efficiency for the removal of foreign particles. The technical difficulties encountered in measuring the quantities of dust retained in the nose have prevented confirmation of his observations.

It is generally assumed that at least half of the foreign matter in inspired air will be removed by these mechanisms in the normal nose, trachea and bronchi. There has been considerable speculation but little proof of the influence of disease in these organs. It is argued that the chronic bronchitis often associated with silicosis probably permits unusual quantities of dust to enter the lungs. As a matter of observation, the lungs of animals with purulent bronchitis actually contain much less dust than those of normal ones exposed to the same concentration. The heavy plugs of secretion in the larger air passages mechanically prevent the ingress of foreign particles. It has also been pointed out that one of the manifestations of chronic bronchitis is epithelial metaplasia with the formation of a smooth lining membrane that should permit freer passage of dust particles into the lungs. One should remember, however, that such metaplasia is practically never generalized and that it almost always involves one or two bronchi immediately adjacent to a focus of chronic disease inside the lung. Such a condition might account in part for the unusually heavy deposits of dust in the localized pulmonary focus of infection, but it would have little influence on the rest of the lungs. Thus some phases of tracheitis and bronchitis may be protective mechanisms, and until their influence has been evaluated it is best to refrain from inference.

The discussion thus far has dealt only with particulate foreign bodies, but where fibrous materials are concerned the upper respiratory protection would seem to be less adequate. Since asbestosis constitutes one of the dangerous forms of pneumoconiosis to be discussed, certain exceptions to what has been said must be noted at this point. Apparently many of the long asbestos fibers succeed in sliding over the surface of ciliated epithelium, for the lungs contain plenty in excess of from 10 to 20 microns in length, and occasional ones as long as 200 microns have been discovered. These fibers seem to pass through the smooth walled bronchi quite readily, but when they reach the respiratory bronchioles the alveolar pouches given off from the sides of these tubes entrap and retain them. Whether the same is true of all fibrous foreign bodies has not been established.

Little is known about the primary distribution of inhaled foreign particles within the lungs or the factors which govern it. It has been observed that carmine particles reach the subpleural alveoli within half an hour after animals have been exposed to heavy atmospheric suspensions of such material. The path of these particles, the influence of tidal and residual air, the effect of deep or shallow breathing all remain to be investigated. Posture and specific gravity probably have little influence on particles as small as 3 microns or less in diameter.

Secondary deposition of inhaled inert particles, on the other hand, has been investigated more extensively. Gross inspection of the lungs often shows streaks of pigmentation in the pleural surface, arranged in bands that are opposed to the intercostal surfaces, with little or no deposit in the intervening grooves formed by the ribs. Likewise the diaphragmatic surfaces are practically free of dust. Such distribution implies that pressure of overlying parts has prevented local deposition. Furthermore the heaviest deposits tend to occur in the upper two thirds of the pleura, suggesting that the greater excursion of the lower portion of the lung may have limited retention. Examination of a section of the lung is not so informative because the various structures are cut in so many planes. However, inspection with a lens will usually demonstrate fine linear deposits along the connective tissue septums, between lobules and around the medium sized blood vessels. The walls of the bronchi always show much less pigmentation. In very severe cases of pure anthracosis the entire lung may be uniformly black. Almost always the lymphoid tissues within the lungs and those of the nodes at their root are more or less heavily pigmented.

To understand this distribution of inhaled pigment one must appreciate the mechanisms provided for its elimination from the air spaces. These mechanisms include the mobile alveolar phagocytes and the pulmonary lymphatic system.

Alveolar Phagocytes.—These originate in the walls of the air spaces, become detached and are capable of independent ameboid activity. Their origin is still debated, but it is my own belief "that they belong to the general group of wandering cells of connective tissue, variously known as histiocytes, clasmatoocytes and the like. Others think that they may be modified epithelial cells from the alveolar lining and some observers consider them monocytes that have wandered out of the blood vessels. This is not the place to discuss the evidence for these views. Whatever their origin, these

5. Lehmann, Gunther: *Die Filterung der Atemluft und deren Bedeutung für Staubkrankheiten*, Berlin, Julius Springer, 1938.

6. Gardner, L. U., and Smith, D. T.: *The Origin of the Alveolar Phagocyte*, *Am. J. Path.* 2: 445-460 (Sept.) 1927.

cells appear in the alveoli in numbers corresponding to the quantities of inhaled foreign bodies. As chance contacts are established, the particles of dust are ingested by the cells.⁷ The process may be repeated so often that many phagocytes contain enough foreign material to obscure their internal structure. Often the cell enlarges as it engulfs more particles. The phagocyte moves slowly over the inner surface of the air space until it finally comes to rest in the vicinity of a lymph vessel. Whether there is any force which guides its course has never been established.

Lymphatic System.—The final stage in the process of freeing the air spaces of accumulated foreign particles is a function of the lymphatic system. Space forbids a complete description of the pulmonary lymphatics but it should be recalled that the lungs are provided with two sets of lymph vessels, one coursing through the pleura and another located in the connective tissue sheaths of blood vessels and bronchi. The superficial and deep sets communicate with one another by means of short thick vessels situated in the septums between subpleural lobules; these permit lymph to flow from the interior of the lung to the pleura in case of obstruction in the deep system. Wherever lymphatic trunks communicate with one another inside the lung there are masses of lymphoid tissue. These points are located in the pleura, at the distal ends of the alveolar ducts and where blood vessels or bronchi bifurcate. The lymphoid nodules increase in size as the hilus is approached. Both superficial and deep lymphatics discharge most of their lymph into large nodes located about the bifurcation of the trachea, referred to in this communication as the tracheobronchial nodes. Efferents from the lower portion of both lungs pass through the crura of the diaphragm to nodes situated along the esophagus and cardiac end of the stomach.

Dust particles are carried into the lymphatic vessels either by mobile phagocytes or in the free state. The mechanism in the latter case is not understood.⁸ Many come to rest in and about intrapulmonary lymphoid deposits; more are borne along and deposited in the tracheobronchial nodes. In experimental animals the first deposition is in the nodes, and as these structures become filled increasing quantities are found in the successively peripheral nodules of pulmonary lymphoid tissue. Strachan and Simson⁹ described similar deposition in human lungs.

Not all the inhaled material is removed to the lymphoid tissues; in most lungs considerable pigment is also found in the areolar tissue surrounding the lymph vessels. These deposits often seem to be made up of elongated collections of free particles packed between the fibers of connective tissue. Haythorn,¹⁰ however, has demonstrated that many of these particles are actually contained within the bodies of compressed phagocytes. On production of an edema that separates the fibers and allows the "dust cells" to assume their more familiar spherical form, the intracellular distribution of the particles again becomes recognizable.

It is not known whether such perilymphatic deposits are composed of material that is temporarily stored in

the areolar tissue until it can be carried off through the lymphatic vessels or whether, having entered a vessel at some peripheral point, it has subsequently escaped into the surrounding tissue. In any event such deposition occurs in the pulmonary framework, a location where the foreign body can exert no influence on respiratory function.

These perilymphatic and lymphoid tissue accumulations of particles are responsible for the pigmentation seen on gross inspection of the lungs. On the pleural surface the delicate tracery of lines is made up of accumulations in the areolar tissues about the superficial lymph vessels; the focal collections occur in lymphoid tissues at the junction of communicating and superficial lymph vessels. Similar relationships exist in the depths of the lungs. The generalized diffuse pigmentation often seen in the lungs of persons dying during exposure to dust is due to free and phagocytosed particles still within the air spaces. In cases in which diffuse pigmentation is still present years after exposure has ceased, the "drainage" mechanisms have been inadequate to remove the excess of inhaled particles. However, the next section will indicate that even within the air spaces most kinds of particles produce no apparent changes that could interfere with respiratory function.

THE HISTOGENESIS OF PNEUMOCONIOSIS

Phagocytosis and Concentration of Dust.—It is in the phagocytes that foreign bodies first exert their specific influences on living cells and that differences due to physicochemical composition of the irritant become manifest. Inert substances like garnet, silicon carbide and aluminum oxide have no effect on the structure of the cell, although they may retard or stop its locomotion by their mass within its cytoplasm. Frequently such overloaded phagocytes are found within the alveoli years after exposure to dust has ceased.¹¹

Toxic free silica, on the other hand, quickly injures the phagocytes, and its effect is directly proportional to the number and size of the ingested particles. Such effects are most readily observed in experimental animals killed at intervals during exposure to high concentrations of siliceous dust, but they can also be seen in human cases of rapidly developing silicosis. No changes are visible in the cell that has taken up a few large fragments 4 or more microns in diameter, but when the particle size is under 3 microns the number ingested by each cell is much greater and, as a consequence, the amount of surface in contact with cytoplasm is greatly increased. Degenerative changes closely simulating those in the "epithelioid" cells of tuberculosis then become manifest. The cell enlarges, droplets of visible lipoid appear in the cytoplasm and the elements stained supravitaly with neutral red are rearranged to form patterns indistinguishable from those in tuberculous epithelioid cells.¹² With the proper concentration of the irritant, the nucleus divides repeatedly as the cytoplasm increases in extent; the result is a giant cell in every way comparable to the Langhans giant cell of tuberculosis. In animals injected with extremely fine silica, such giant cells may attain astounding size with several hundred nuclei. Under very potent stimulation the cell is killed and undergoes

7. Fenn, W. O.: The Phagocytosis of Solid Particles, *J. Gen. Physiol.* 3: 439-464 (March) 1921.

8. Drinker, C. K., and Field, Madeleine E.: Lymphatics, Lymph and Tissue Fluid, Baltimore, Williams & Wilkins Company, 1933.

9. Strachan, A. S., and Simson, F. W.: A Preliminary Study of the Pathology of Silicosis as Seen on the Witwatersrand: Silicosis, International Conference at Johannesburg, Geneva, 1930, pp. 221-248.

10. Haythorn, S. R.: Experimental Edema as an Aid to Histopathologic Studies, *Warthin Ann.* Vol., pp. 491-502, 1927.

11. Gardner, L. U.: Studies on the Relation of Mineral Dusts to Tuberculosis. III. Carborundum, *Am. Rev. Tuberc.* 7: 344-357 (July) 1923.

12. Gardner, L. U.: The Similarity of the Lesions Produced by Silica and the Tubercle Bacillus, *Am. J. Path.* 13: 13-23 (Jan.) 1937.

a process that Mavrogordato¹³ described as "mummification." It retains its normal size and the limiting membrane is intact, but all internal structures fail to stain with histologic dyes. Some of these "ghost cells" preserve their identity, but others probably break up and liberate their contents, which are then taken up by new phagocytes.

The great similarity between the effects produced by crystalline silica and tubercle bacilli¹² has puzzled many observers, but Fallon¹⁴ has proposed a hypothesis and already published preliminary experiments which may contain the explanation. He conceived the idea that the action of both these primary irritants on the phagocytes liberates toxic phospholipids and that these substances are responsible for the further proliferation that results in the formation of the granulomatous nodule. He demonstrated that such lipids, at least partially freed of silica, were actually capable of producing tubercles.

Finally there is a suggestion that small quantities of silica taken up by phagocytes tend to stimulate ameboid activity,¹⁵ for in early silicosis the cells seem to migrate to lymphoid tissue more rapidly than in any other form of pneumoconiosis. However, it is difficult to be certain whether the clusters of cells observed in and about the nodes have actually migrated there or whether new ones may have proliferated under the stimulation of the toxic material.

The response of the phagocytes to fibrous asbestos requires special comment, as it is treated in a different manner from particulate material. The fibers are often too long to be completely ingested by a mononuclear or giant phagocyte. Frequently one end will project beyond the border of the cell, or sometimes several phagocytes will attach themselves to a single fiber. Giant cells do not migrate far and most of them are either applied to the walls of the bronchiole or at most have penetrated its substance. It is practically impossible to discover fibers or asbestosis bodies in the more remote intrapulmonary or mediastinal lymphoid tissues.

For all dusts the mechanisms of phagocytosis and concentration have many common features but, as indicated, even the initial cellular responses are modified by the properties peculiar to the three classes of minerals under consideration. Because these changes are microscopic, it has been convenient to consider them together. We are now in a position to consider the three generally recognized anatomic forms of reaction to mineral dusts under the headings benign nonspecific pneumoconioses, silicosis and asbestosis.

THE BENIGN NONSPECIFIC PNEUMOCONIOSES

In the category of benign nonspecific pneumoconiosis is included every known reaction to mineral dust except that to the soluble poisons such as lead, the specific diseases, silicosis and asbestosis, and "roentgenologic conditions" such as baritosis and the pseudonodulation of arc welders, previously mentioned.

We have seen that the action of the alveolar phagocytes and the lymphatic system tends to concentrate particulate mineral matter, regardless of its chemical composition, in the lymphoid tissues of the lungs and mediastinum and that there are also appreciable accumulations in the areolar tissues about lymphatic trunks.

The reaction that will be produced in these locations is determined by the physicochemical properties of the minerals concerned. As shown in the first paper, on etiology,⁴ most of them exert no appreciable effects on connective tissues; a few can produce low grade chronic inflammation which is not progressive and does not terminate in fibrosis appreciable on gross examination. All these reactions occur in the framework of the lung. The only secondary effect is the dilatation of the few air spaces that directly abut on the pigmented connective tissues. Such emphysema never involves other parts of the lung and is too restricted in extent to have functional significance.

Gross appearances are determined largely by the color of the inhaled dust. If it has no color, no abnormality may be detectible. If in masses it appears black, the diagnosis will probably be "anthracosis" in the absence of a history of exposure to a specific kind of mineral; really it makes little difference. The pleural surface of the lung is flecked with focal and linear deposits of pigment. The cut surface shows the linear collections in the septums between lobules, the thin streaks along branches of the pulmonary arteries and the rounded flecks scattered here and there which a lens identifies as perivascular accumulations about cross sections of arterioles. The air spaces are always visible in the colored areas, a feature which distinguishes the benign pneumoconiosis from all silicotic reactions. Both the intrapulmonary and the mediastinal lymphoid tissue stand out in sharp contrast by reason of their color. In extreme cases the pigmentation is diffuse and the entire pleural and cut surface of the lung may be black. But in no case is there enough reaction to be detected by palpation or gross inspection.

The shadows cast by such changes on a roentgenogram tend to exaggerate their importance. Except in the most advanced cases the pattern is merely one of exaggeration of the normal lung markings. Since most of the latter are due to the blood vessels, their shadows become heavier and the finer branches are visualized when they are thickened by a sheath of dust and chronic inflammatory reaction. In advanced cases the film may present a reticulated appearance due to the thickening of peripheral arterial twigs and the interlobular septums. The diffuse haziness observed in certain cases may be caused by the presence of great numbers of phagocytes scattered throughout the air spaces. Enough of them in superimposed planes of tissue will intercept some of the x-rays and register a haze on the film.

Since the blood vessels may be thickened from causes other than deposits of dust in their outer coats and since such thickening becomes increasingly frequent with advancing age,¹⁶ there is a great possibility of error in ascribing the exaggerated linear markings seen in a film to occupational factors. In older persons particularly one must beware of diagnosing benign nonspecific pneumoconiosis from a roentgenogram and a history of exposure to dust.

It is hard to imagine that pulmonary symptoms or disability could be produced by reactions of this character. There is generally no involvement of the alveolar walls at all. While in advanced cases there may be a little emphysema, it is confined to only a few air spaces immediately about the pigmented connective tissues of the lung. Even in extreme cases presenting

13. Mavrogordato, A.: Studies in Experimental Silicosis and Other Pneumoconioses, South African Institute for Medical Research, No. 15, 1922, pp. 1-58.

14. Fallon, J. T.: Specific Tissue Reactions to Phospholipids: A Suggested Explanation for the Similarity of the Lesions of Silicosis and Pulmonary Tuberculosis, *Canad. M. A. J.* 36: 223-228 (March) 1937.

15. Gardner, L. G.: Studies on Experimental Pneumoconiosis: VIII. Quartz Dust, *J. Indust. Hyg.* 14: 18-37 (Jan.) 1932.

16. Gardner, L. G.; Durkan, T. M.; Brumfiel, D. M., and Samuels, H. L.: Survey in Seventeen Cement Plants of Atmospheric Dusts and Their Effects upon the Lungs of 2,200 Employees, *J. Indust. Hyg. & Toxicol.* 21: 279-318 (Sept.) 1939.

diffuse pigmentation the lung is still elastic and the respiratory membranes show no abnormality. If symptoms are associated with such reactions they are in all probability due to causes outside the lungs.

As far as can be learned from statistical and experimental evidence, the dusts other than free silica are not responsible for alteration of natural susceptibility to tuberculous infection. There is no proof that their inhalation increases the probability of infection with other organisms. In some of the dusty trades, investigation is disclosing that other factors than the dust are responsible for pulmonary infection.

Scars or imperfectly healed infections in the lungs of persons exposed to these inert or practically inert minerals are sometimes a cause of confusion. They attract and retain abnormal quantities of inhaled dust particles and it is possible, though not yet proved, that such deposits may maintain a preestablished chronic inflammatory reaction. Hence there may be less contraction and less tendency for the area of disease to disappear. Such an outcome is not inevitable, but many more cases will have to be followed in serial roentgenograms before its frequency is established.

Much more puzzling are the patients with obvious fibrosis whose history records only exposure to inert minerals. In most of these instances a review of the facts and a chemical examination of the tissues will disclose that there has been free silica either in the last or in previous exposures. An apparently comprehensive occupational history and the histologic evidence of a single autopsy specimen does not warrant the inference that a mineral other than free silica has caused the fibrosis. Quartz dust masquerades in unsuspected places where much ingenuity may be needed to detect it.

SILICOSIS

Initial Phase.—As already intimated, silicosis begins like the reaction to any other particulate dust, but the peculiar properties of free silica are responsible for subsequent modifications of the standard pattern. Migratory phagocytes concentrate silica in and about the lymphatic system of the lungs. The toxic particles, directly or indirectly through the released lipoids, stimulate connective tissue cells in their immediate vicinity and proliferation ensues. The ultimate result is a nodule composed of connective tissue whose fibers are characteristically modified by the effect of the silica. The location of these nodules, situated in the immediate vicinity of the lymphatic trunks, impedes the free flow of lymph. Such a development of microscopic silicotic nodules in the tracheobronchial lymph nodes and intrapulmonary lymphoid tissues constitutes the primary phase of silicosis.

Grossly these early nodular lesions are invisible or recognizable only with a magnifying glass. Usually there is enough carbon or other colored dust inhaled with the silica to produce the linear and focal pigmentation previously described for inert nonspecific pneumoconiosis. Obviously a roentgenogram of such a lung will reveal the shadows of the perivascular deposits but not those of the nodular lesions that are too small to be seen without a microscope.

A history of exposure to a dust rich in free silica with a roentgenogram showing only exaggeration of the linear lung markings presents a problem in diagnosis. I myself believe that if other causes can be eliminated the case should be classified as a benign nonspecific pneumoconiosis, for there is nothing pathognomonic about the film and there is at least only one

chance in four that the disease will subsequently progress to nodulation. Others will argue that the history should be given more weight, and they would call such cases presilicotic.

If silicosis in this early state is not definitely diagnosable during life, has it any significance? Will it progress? Does it increase susceptibility to tuberculosis? The probabilities of progression to a stage of generalized nodulation are slight if the exposure should be interrupted at this stage. This is not necessarily true in the case of a worker such as a sandblaster whose exposure has been heavy and who has attained the stage of linear exaggeration rapidly. With ordinary exposures, however, there would not be enough silica accumulated in the air spaces to produce fresh nodules if no more dust were inhaled. With regard to susceptibility to tuberculosis, statistics on groups of men exposed to relatively high concentrations of silica show a slightly higher incidence of this infection in those with exaggerated linear markings than in those with no visible evidence of reaction to dust. The odds are against a silicotic origin in an individual case, but it could not be proved that silica was not a factor, particularly when atmospheric concentrations of this mineral may have been high.

If there is no probability of progression or no increase in susceptibility to tuberculosis, does early silicosis of this degree have any influence on the body? The only effect thus far discovered is the increased probability that continued exposure to silica dust will ultimately result in more advanced stages of silicosis.

The latter raises problems of administration, the answers to which depend on local conditions and the status of the subject. If the individual is young and linear exaggeration has developed quite rapidly in an environment heavily polluted with free silica dust, he should probably be transferred to some other position. If he is older and serial roentgenograms have shown that such changes have been present for a long time, he can unquestionably remain where he is, especially when an enlightened management is making every effort to reduce the concentration of dust in the working atmosphere. His roentgenographic changes may be due to other causes and hence will not progress because of these conditions.

At this stage of the disease there is no disability or any limitation of respiratory function because the lesions do not encroach on those portions of the lung in which respiration occurs. If physical examination discloses evidence of disability, the cause must be found outside the lungs.

Discrete Nodulation of Classic Silicosis.—After enough silicotic reaction has developed in the lymphoid tissue to retard the flow of lymph, fresh increments of inhaled silica are not as readily removed from the pulmonary air spaces. The phagocytes still ingest particles and migrate with them over the surface of the alveolar lining. Unexplained conditions in the lymphatics (possibly increased lymph pressures) now seem to prevent the cells from entering the vessels. As a matter of observation, most of them collect in groups scattered here and there on the walls of the air spaces. Again the high local concentration of silica results in proliferation of connective tissue cells. Parenchymatous nodules now develop, which ultimately attain a diameter of 3 or 4 mm. They are characterized by the sharp definition of their borders, by their uniform composition of hyaline collagen fibers arranged either

in concentric laminas or in coarse basket weave and by their regular distribution throughout all parts of both lungs. Certain variations are encountered, but these do not cause difficulties in diagnosis. The centers of young nodules may be necrotic when the disease evolves rapidly. Peripheral accumulations of non-siliceous dusts may cause a fringe of more cellular connective tissue that more or less modifies the usual sharpness of the border. The costophrenic portions of the lungs may contain no nodules owing to the development of emphysema in these areas subsequent to the contraction of the many fibrous foci in other parts of the lung. In the early case the tracheobronchial lymph nodes are enlarged, but as the scar tissue contracts they shrink and become exceedingly hard.

The shadows of these larger nodules uniformly distributed throughout the parenchyma of both lungs form a characteristic roentgenographic pattern. When associated with a history of adequate exposure to silica dust and an absence of any very marked physical signs, such a film constitutes an adequate basis for the diagnosis of silicosis. Clinicians generally classify cases of silicosis in three stages, defined by the number and size of the nodular shadows. In stage 1 the linear markings are markedly exaggerated and the nodulation is barely visible; in stage 2 the linear shadows are obscured and each nodule is from 2 to 3 mm. in diameter; in stage 3 the nodules measure from 3 to 6 mm., are less well defined and show a tendency to confluence in certain areas. There is generally a suspicion of associated infection in films interpreted as stage 3.

The clinical significance of generalized discrete silicotic nodulation is not nearly as great as inspection of the film might indicate. Roentgenographic surveys always reveal many cases which have developed entirely unsuspected by the subjects, who have continued to perform their habitual work with no symptoms of respiratory embarrassment. Only shortness of breath on sudden and unusual exertion demonstrates that the respiratory reserve has been reduced. In other words, there is still so much uninvolved lung tissue that normal respiration is unimpaired. Persons with nonclinical silicosis are not disabled and from a medical point of view are employable. Since they are usually skilled by virtue of long experience, the management would generally prefer to keep them at work. However, liability for compensation has complicated the picture and has been responsible for a lamentable rejection of many able workmen.

The nodular stage of silicosis is associated with a definite increase in susceptibility to tuberculosis. This is attested by the old South African figures, which showed tuberculosis of the lungs in 75 per cent of the silicotic miners who died. In the Saranac Laboratory autopsy series active tuberculosis was present in 65 per cent of the lungs of persons exposed to free silica dust and in only 15 per cent of those working in other dusts. Official figures from the Factory Department of the British Home Office¹⁷ disclosed evidence of tuberculosis in 59.4 per cent of the autopsies on silicotic subjects.

The infection may develop as a result of reactivation of a preexisting latent tuberculous focus, but opinion today is unanimous that new infections from without are a more common cause. A contact with the tubercle bacillus, which in normal subjects would perhaps be

quite harmless, is apt, in the silicotic lung, to result in chronic progressive infection. Obviously such contacts cannot occur unless there are open cases of tuberculosis in the locality. In areas in which general living conditions have improved and routine antituberculosis hygienic measures have been put in practice the tuberculosis rate has fallen, among the silicotic as well as among the other members of the community.

The case for nontuberculous infections is not so clearly documented and today it would be well to turn back to Collis's Milroy Lecture of 1915,¹⁸ in which he took great pains to show that pneumonia is relatively uncommon with silicosis though prevalent with "the pneumoconioses that cause bronchitis." Other statistics were published subsequently, however, that showed high frequencies of pneumonia in different dusty trades, and autopsies on silicotic subjects demonstrated the common occurrence of massive areas of fibrosis which closely simulated the end result of an organized pneumonia. Most observers came to believe that the same mechanisms which increased susceptibility to tuberculosis also favored the growth of pneumococci and other bacteria. Thoughtlessly silica was accepted as the common etiologic factor.

But new investigations of silica industries showed that excessive pneumonia rates did not prevail in all of them. Then the importance of exposure to extremes of temperature, humidity and the like assumed proper significance in the silica industries as in others. In mining groups it was shown that the pneumonia rate dropped to approximately that of the local community when the change house was moved to the head of the shaft so that the sweaty, overheated miner no longer had to expose himself to winter weather on coming to the surface. Similarly it is now believed that in the foundry the influence of sudden changes of temperature is much greater than the silica dust, to which only a few of the employees are exposed in dangerous concentrations. In many modern mining areas the incidence of pneumonia is no higher than that in the general population; and the course of the disease when it does develop is usually normal.¹⁹

Pathologic material uncontrolled by a knowledge of general clinical experience may be misleading, owing to selection of cases submitted for examination. It may well be true that some of the massive conglomerate foci seen in lungs are the result of organized pneumonia, but serial roentgenograms of certain silicotic groups make it appear doubtful whether organization is the common outcome.

Experiments by Vorwald, Delahant and Dworski²⁰ show that in rabbits silicosis alters in no way susceptibility to type III pneumococcus or the course of the resultant pneumonia. It is anticipated that similar tests will be made with other types of this organism.

Until accurate statistics based on reliable clinical and bacteriologic data for pneumonias of different origins become available, it would be unwise to generalize. At the present time, however, American experience does not seem to indicate that silicosis has an appreciably unfavorable influence on lobar pneumonia. Possibly infections due to organisms outside the pneumococcus group are in a different category.

18. Collis, E. L.: Industrial Pneumoconioses with Special Reference to Dust Phthisis, Milroy Lectures, 1915, *Pub. Health* 28: 232-239, 1914-1915; 29: 11, 1915-1916.

19. Pierpont, D.: Fourth Saranac Laboratory Symposium on Silicosis, 1939, Employer's Mutuals Insurance Company, Wausau, Wis.

20. Vorwald, A. J.; Delahant, A. B., and Dworski, M.: Silicosis and Type III Pneumococcus Pneumonia: An Experimental Study, to be published.

17. Merewether, E. R. E.: A Memorandum on Asbestosis, *Tubercle* 15: 109-118 (Dec.) 1933, 152-159 (Jan.) 1934.

Rapidly Developing Silicosis.—Whereas most cases of silicosis require at least from three to six and more often from ten to twelve years of exposure for their development, there are isolated industries in which exposures of from twenty to twenty-four months have produced a modified form of the disease. Under conditions that liberate excessive quantities of exceedingly fine pure silica the ordinary protective mechanisms fail to cope with the situation and an unusual kind of reaction develops. The initial phase of lymphatic involvement is lacking. The overwhelming deposits of silica seem to stimulate connective tissues in every part of the lung at the same time, and as a consequence the alveolar walls become thickened and nodules of microscopic proportions develop throughout the pulmonary framework. The air spaces are filled with actively proliferating phagocytes. Irvine²¹ has aptly described the picture as a "dust pneumonia."

Gross examination reveals no nodules visible to the naked eye; there is merely a generalized partial consolidation of the lungs. All the postmortem specimens that I²² have seen have been complicated by infection which completed the solidification of the involved areas. Because the nodules are too small to be seen without a microscope they do not cast discrete shadows on a roentgenogram. Except when infection complicates the picture, the film generally shows little but a heavy diffuse haze because most of the air spaces contain enough air to permit the passage of some of the x-rays. The diagnosis in these cases rests not on the film but on the presence of extreme dyspnea in a case in which other causes have been eliminated and on the history of an exposure to excessive quantities of exceedingly fine and pure free silica. This diagnosis is never warranted except in the case of unusually severe exposures such as those in unprotected sandblasting or in drilling pure quartz without the ventilation found in ordinary mining practice.

Most of the fatal cases terminate in tuberculosis, as indicated by Middleton's²³ summary of English experience. Foci of necrosis produced by the excessive concentration of fine silica in the microscopic nodules throughout the lungs furnish the most favorable medium conceivable for the growth of the bacilli. A few patients have succumbed to nontuberculous bronchopneumonias, and very rarely it is possible that the silicosis itself may cause death. However, it should always be remembered that evidences of infection are not uniformly distributed and may be hard to distinguish on gross examination of a lung heavily involved with such a reaction to dust. Review of a few small sections in one of Chapman's²⁴ "soap powder cases" failed to disclose evidence of tuberculosis, but so little tissue was available that the possibility of localized infection could not be excluded.

Modified Silicosis.—When the atmospheric dust is composed of a mixture of particles of free silica with those of other minerals such as coal, iron and various silicates the characteristic nodular reaction is modified in varying degrees. When the dust contains enough free silica, nodular fibrosis develops in the pulmonary

parenchyma although the collagen may not show its characteristic hyaline, laminated appearance. The other minerals in the dust tend to be deposited in the interlobular septums and walls of arteries as they would in benign nonspecific pneumoconiosis, but they also collect around the margins of the parenchymatous nodules. The result is a combination of nonspecific pneumoconiosis and silicosis with the specific lesions of each modified by the presence of another type of dust. The linear perilymphatic deposits are heavier and tend to be fibrous; the nodules are larger and lack definition because of fringes of cellular connective tissue. Frequently projections from the nodules are continuous with chronic inflammation about vessels and septums. Reaction about adjacent nodules may replace considerable numbers of air spaces, giving rise to a small conglomerate focus. However, patent air spaces are always present in the involved area. The fibrosis is never of the massive obliterative type to be described later, in which the tissue is uniformly hard and rubber-like in consistency.

Generally the roentgenologist does not attempt to differentiate between these modified forms of silicosis and those produced by purer silica. In occasional extreme cases, however, the nodular shadows may lack their characteristic definition and uniformity in size, the vascular markings will be unusually heavy and there may be a background of more or less uniform reticulation.

Susceptibility to tuberculosis may be more or less favorably modified in these cases. In siderosilicosis due to hematite, tuberculous infection in both man and animals progresses for a time and then in many cases heals with the formation of masses of scar tissue. The same is apparently true of anthracosilicosis, which often requires prolonged search to discover evidence of the tuberculous element in the healed focus. In granite silicosis, tuberculous infection is much more apt to progress and terminate in cavity formation with disseminated infectious lesions.

Since most industrial dusts are mixtures, modifications of the classic picture of pure silicosis are the rule rather than the exception. It cannot be too strongly emphasized that both the pathologic and the clinical manifestations of silicosis in different industries are not identical in all details. Observations that are perfectly valid for anthracosilicosis may be inapplicable to miners of other hard rock, granite cutters or porcelain workers.

Massive Conglomerate Fibrosis.—This pathologic feature of the disease is the common cause of most of the disability in silicotic subjects. Unfortunately it presents vexatious problems in diagnosis and administrative treatment. During life it may be difficult to differentiate it from the simple conglomerations just described under modified silicosis. In this country and in South Africa most observers think that massive conglomerate fibrosis is due largely to associated infection. In recent years I have come to feel that a third essential factor may be the presence of minerals other than free silica. At the present time it is impossible to classify all areas of conglomerate fibrosis on an etiologic basis. Microscopic examination reveals an element of tuberculosis in 60 per cent of the cases; in the remainder this feature is either absent or escapes detection because it is obscured by the silicotic fibrosis. Although most or perhaps all of these massive fibrous lesions may have developed on a background of tuberculosis, the

21. Irvine, L. G.: Report of the Commission to Enquire into the Possible Prevalence and Origin of Cases of Silicosis, in the Colony of Southern Rhodesia, Salisbury, Government Stationery Office, 1938.

22. Gardner, L. U.: Pathology of So-Called Acute Silicosis, *Am. J. Pub. Health* 23: 1240-1249 (Dec.) 1933.

23. Middleton, E. L.: Industrial Pulmonary Disease Due to the Inhalation of Dust with Special Reference to Silicosis, *Lancet* 2: 1-9 (July 4), 59-65 (July 11) 1936.

24. Chapman, E. M.: Acute Silicosis, *J. A.M. A.* 98: 1439-1441 (April 23) 1932.

problem is to recognize the ones in which the infection is still active. For them some form of treatment is indicated. No treatment in use today is ideal, for all of them tend to promote healing by fibrosis and it is the scar tissue that causes the disabling dyspnea.

Names were coined by the Miners Phthisis Medical Bureau of South Africa to indicate reciprocal relationships between silicosis and tuberculosis in these chronic forms of the disease. "Tuberculosilicosis is the modification produced in silicotic lesions by a chronic tuberculous infection." Here the dust factor is dominant. "Silicotuberculosis," on the other hand, is a clinical term used to indicate that the infectious element is more prominent. On the suggestion of Dr. L. G. Irvine, chairman of the bureau, the last International Silicosis Conference in Geneva adopted the pathologic term "tuberculosilicosis" as the standard one to describe this specific chronic lesion. It is not applicable to every manifestation of tuberculosis in the silicotic lung. When the infection develops typically, as it does in nonsilicotic subjects, the diagnosis should be "silicosis with tuberculosis." Such cases are rare, however.

The anatomic picture of massive conglomerate fibrosis is variable, although there are certain features that characterize all such lesions. The involved area is hard and rubber-like, is blue-black or gray-black, has rather sharply defined borders and is practically always associated with high grade compensatory emphysema. If the area of involvement extends to the surface of the lung there is always chronic fibrous pleurisy with adhesions. Most cases occur in organs showing a background of generalized discrete nodulation, but there are some in which this diagnostic feature is lacking. In the latter case it is possible that contraction of the mass has drawn most of the original nodules into its orbit and that the more peripheral portions of the organ have subsequently been distended by emphysema.

The distribution and extent of the fibrosis varies. The massive scars occur most often in the upper part of one or both lungs. Some radiate from the hilus; some assume the form of wedges with their bases on the pleura; others grow as tumor-like masses in the depths of the lung. They may involve the whole of a lobe and even extend across an obliterated interlobar fissure.

The cut surface of the conglomerate focus generally shows a more or less well defined nodular structure, but at times this is recognizable only with a magnifying glass. Some show central areas of caseation and cavity formation indicative of their tuberculous origin; others are traversed by irregular slitlike openings filled with inky fluid. The latter have no well defined walls and are not differentiated by color from the surrounding fibrosis.

Microscopic sections reveal nodules embedded in a matrix of heavily pigmented hyaline fibrous tissue that replaces practically all normal pulmonary structures. Blood vessels show high grade obliterative endarteritis and often their lumens are filled with dust-containing connective tissue. The larger bronchi are compressed and distorted. When patent, they present advanced chronic inflammatory changes. Tuberculous reaction may be obvious in widespread caseation, but in cases in which the infection has healed it has sometimes been necessary to search over 200 square centimeters of section to discover isolated noncaseous tubercles. In a few cases even this evidence is lacking, but clumps of acid-fast bacilli without cellular reaction are found in areas

of softening. Guinea pig inoculation has supplied proof that the organisms are tubercle bacilli. Examination of the black slitlike cavities has generally revealed no suggestion of tubercle and these cavities have been interpreted as areas of anemic necrosis resulting from the obliterative endarteritis.

In view of the difficulties of diagnosis it would appear unwise to draw any conclusions as to the frequency of nontuberculous massive conglomerate fibrosis.

The shadows of such changes on the roentgenogram offer an easier problem in diagnosis when they occur on a background of generalized nodulation. When this is lacking even the silicotic nature of the disease may be in doubt. Stereoscopic films may permit visualization of discrete nodules otherwise obscured. Overexposed films may bring out tuberculous cavities in the midst of massive shadows, but often none can be seen. The behavior of the shadows in serial examinations over periods of years is perhaps the most reliable index of activity of the process.

The clinical manifestations in many of these cases may likewise be confusing. Often severe dyspnea is the only prominent symptom. Perhaps there has been no loss of weight. The sputum may be repeatedly negative or on rare occasions prove positive by culture or guinea pig inoculation, but if followed long enough the infection in many of these cases will become manifest. Toxic symptoms then suggest tuberculosis; bacilli are constantly present in the sputum; roentgenograms may reveal cavity formation and more rapid extension of the massive lesion. When this is the case death from tuberculosis is the outcome, but the individual in whom the infection has completely healed succumbs to other causes.

Cardiac Involvement.—The question as to the relationship between silicosis and disease of the heart is still debated. Observers primarily interested in silicosis who are following the course of the disease in groups of employed workmen are unanimous in their opinion that cardiac complications are not unusually common. They admit that some silicotic patients exhibit symptoms referable to the heart but point out that the age group in which silicosis develops is also the one in which arteriosclerosis and myocarditis are general. The clinician whose experience is limited to the general hospital, on the other hand, is confronted with a selected group of silicotic subjects. These men have applied for hospitalization because they are sick and often about to die; those who are obviously tuberculous may be transferred to sanatoriums. Thus the internist is naturally impressed by the high proportion of cardiac conditions among his silicotic patients. The pathologist's views are likewise colored by the source of his material. Cardiac complications are rare in able-bodied workmen killed by accidents, but they are not at all exceptional in the older men who die in hospitals at the age of 55 or 60 years. Furthermore, both clinician and pathologist may form unusual concepts of the disease if their material is drawn from a single industry. For example, the anthracosilicosis of the hard coal miners is especially prone to manifest itself as massive conglomerate fibrosis, and it is quite probable that such disease may cause more cardiac complications than the discrete nodulation of sand pulverizing or some other kind of mining.

Cor pulmonale is primarily a disease of the right side of the heart resulting from obstruction to the circulation in the lung. One of the most common

causes of such obstruction is high grade emphysema. Silicosis of the massive conglomerate type is liable to produce such emphysema. No one doubts that many patients with long-standing silicosis complicated by conglomerate lesions caused by associated tuberculosis finally die of congestive heart failure. But the same is also true of patients with uncomplicated tuberculosis, and yet one rarely speaks of this infection as a common cause of "heart disease." Personal experience and the reports from the literature have convinced me that in most fatal cases of silicosis the heart is already damaged by arteriosclerosis or other causes and that the presence of a conglomerate area of fibrosis with emphysema merely adds to its burden. At the autopsy table hypertrophy of the right side of the heart without arteriosclerosis and even greater involvement of the opposite side is a rarity. Clinically no one has ever demonstrated evidence of increasing strain on the right side of the heart as the successive phases of simple discrete nodulation make their appearance. Even in the case of massive conglomerate fibrosis cardiac symptoms are relatively late manifestations. Further clinical and pathologic studies will be valuable as far as they differentiate between the types of pulmonary lesions that are alleged to have affected the condition of the heart muscle.

Carcinoma of the Lungs and Silicosis.—General interest in the subject of pulmonary cancer has been responsible for special effort in securing autopsies in such cases. The discovery of coexistent silicosis or even a benign nonspecific pneumoconiosis has led to the deduction of causal relationships that are not supported by statistical evidence. Vorwald and Karr²⁵ collected from the literature the results of roentgenographic examinations of 57,362 persons at work in industrial plants creating dust of various kinds. Although the group contained 12,206 with silicosis, there were only three cases of cancer of the lung. In the Saranac Laboratory surveys of five different industries, films of 15,587 individuals were reviewed with the discovery of 1,357 cases of silicosis. In the total group there were only three cases of pulmonary cancer, one in a silicotic subject and two in nonsilicotic subjects. The authors' most impressive autopsy statistics were quoted from the 1930 Report of the Miners' Phthisis Medical Bureau of South Africa. This official publication cites postmortem figures on 4,510 adult males including 3,117 European miners and 1,393 European males with no underground exposure. The frequency of pulmonary carcinoma was as follows: 1,393 European males, no underground work, 0.93 per cent; 1,679 European miners, no silicosis, 0.71 per cent, and 1,438 European miners with silicosis, 0.70 per cent.

"Tuberculosis" should be less likely to initiate a of epithelium than the tubercle bacillus. The latter not infrequently does cause metaplasia of bronchial epithelium and sometimes carcinoma eventually results. In uncomplicated silicosis, however, there is no effect on the epithelial elements that give rise to cancer. The silica stimulates only the fibroblast or connective tissue cell. If anything there should be an excess of pulmonary sarcomas, but these have not been reported.

In spite of the occasional coexistence of silicosis and primary carcinoma of the lung indicated by published

autopsy reports, it is felt quite definitely that the silica has no etiologic significance. The only dusts known to cause pulmonary carcinoma are those of the radioactive ores in Schneeberg.²⁶ Possibly, as Campbell's²⁷ experiments have suggested, the tar in road dust may also be significant; but this awaits proof.

ASBESTOSIS

It will be recalled that protective mechanisms of the upper respiratory tract appear to be less effective against fibrosis than against particulate foreign bodies and that mobile phagocytes do not remove long fibers from the pulmonary air spaces. As a consequence the greatest accumulation of inhaled asbestos fibers occurs in the lumen of the respiratory bronchiole, the point at which they first come to rest. Almost none are found in the areolar tissues about lymphatic trunks or in the lymphoid tissues inside or outside the lungs. Reasons for believing that the stimulus from inhaled asbestos may be mechanical rather than chemical have been discussed in the first paper on etiology.⁴

Microscopic Appearance.—As long as asbestos fibers continue to be inhaled, scar tissue develops as a gradually thickening sleeve about the respiratory bronchioles. Either because the bore or the tube is smoothed out by the obliteration of the lateral alveoli or because of changes in the lining epithelium, subsequently inhaled fibers then pass on into the alveolar ducts. Here a similar sleeve of fibrosis develops, and this formerly irregular tube likewise permits fibers to pass farther into the lungs. Reaction in the walls of the terminal air spaces ultimately results in a localized patch of obliterative fibrosis of the parenchyma of the lung.

A random microscopic section through an area of fibrosis does not reveal a uniform obliteration of every air space. Here and there are many that still contain air; some are of normal size, some are compressed and many are greatly dilated. These patent air spaces are apparently supplied by other bronchioles that did not happen to be involved in the primary fibrosis. Their intrusion into the area of scar formation is easily understood on reference to Miller's²⁸ models of the terminal branches of the bronchial tree. His diagrams show that the terminal air spaces of different bronchial systems are packed together in such a manner that a single section will contain alveoli given off from widely separated bronchi. Many writers have described this condition as bronchiectasis, but emphysema would seem to be a more apt term as the larger bronchi and bronchioles are never involved.

The scar tissue of asbestosis is in no way peculiar. Unlike that of silicosis, it fails to show a characteristic hyaline swelling of the collagenous fibers. Its arrangement is usually diffuse rather than nodular, although occasional cases such as those reported by Lynch and Smith²⁹ may present a few nodules. Their presence suggests that there may have been an unrecognized contamination of the inhaled dust with free silica.

Because the fibers are not transported, the asbestosis bodies which develop from them will be found very

26. Saupe, E.: Bemerkungen zur Beurteilung der Silikose als entschädigungspflichtige Berufskrankheit, *Klin. Wchnschr.* 9: 1352-1356 (July 19) 1930.

27. Campbell, J. A.: Cancer of Skin and Increase in Incidence of Primary Tumors of Lung in Mice Exposed to Dust Obtained from Tarrad Roads, *Brit. J. Exper. Path.* 15: 287-294 (Oct.) 1934.

28. Miller, W. S.: *The Lung*, Baltimore, Charles C. Thomas, Publisher, 1936.

29. Lynch, K. M., and Smith, W. A.: Pulmonary Asbestosis: II. Report of Case, *Am. Rev. Tuberc.* 23: 643-660 (June) 1931.

25. Vorwald, A. J., and Karr, J. W.: Pneumoconiosis and Pulmonary Carcinoma, *Am. J. Path.* 14: 49-57 (Jan.) 1938.

largely within the scar tissue around bronchioles and the air spaces which they supply. But, as Gloyne³⁰ has pointed out, commercial asbestos usually contains particles of various contaminating minerals. Physiologic mechanisms within the lung are responsible for the sorting out and removal of much of this particulate matter to the pulmonary framework and lymph nodes. There it sets up a nonspecific pneumoconiosis the color and intensity of which depend on the quantity and character of the contaminant. After the development of parenchymatous fibrosis the particulate matter is not removed so readily. Its retention in the patches of reaction due to the asbestos is responsible for the pigmentation seen in advanced cases of asbestosis.

Gross Appearance.—These observations make it easier to appreciate the variable gross picture in asbestosis. The obvious changes consist of patches or strands of dense scar, which are irregular in size, shape and distribution. In advanced cases they are gray or black and included in all of them are thin-walled, dilated air spaces that vary from a few millimeters to a centimeter or more in diameter. Fibrous pleurisy plus a variable amount of pigmentation in the walls of the pulmonary arteries and interlobular septums complete the grosser changes.

More careful inspection, perhaps with the aid of a magnifying glass, demonstrates numerous minute, ill defined patches of fibrosis widely scattered throughout the parenchyma. If they happen to be sufficiently pigmented by minerals other than asbestos, such foci will stand out sharply like those illustrated in color in Gloyne's³⁰ article, but only one of the twenty-eight cases in my collection even approximates this picture. The borders of these lesions invariably lack the sharp definition of the silicotic nodule. Here and there the plane of section will cut one of these areas in such a manner that the thick-walled bronchiole with its peripheral fan of fibrosis is clearly recognizable. The lens demonstrates the presence of dilated air spaces within each fibrous area if these are not already large enough to be seen with the naked eye. Elsewhere the air spaces will be visible, but their walls are much less prominent. The patches of fine fibrosis, scattered throughout the lung, are not sufficiently large or dense to be palpated individually, but they increase the general consistency of the organ and limit its crepitation.

It is now felt that the fine, diffuse fibrosis with emphysematous dilatation of included air spaces constitutes the characteristic feature of asbestosis. Whether the grosser patches of scar tissue represent merely an intensification of the same process in localized areas or whether they are due to reaction to dust in the scars of healed infection is not altogether clear. Sometimes they occur as a thin zone beneath and paralleling the pleura, an arrangement hardly suggestive of infection; at others, more localized patches of scar simulate old foci of infection. The chronic pleurisy is probably not a reliable index of infection, as it seems to occur whenever subpleural air spaces are involved. The thickening of blood vessels and interlobular septums are variable accompaniments due to accidental contaminants in the inhaled dust. The same is true of reaction in the tracheobronchial nodes.

Roentgenograms.—Compared with the microscopic appearances, the roentgenographic shadows of early or even moderately advanced asbestosis are surprisingly

slight: A faint haziness throughout the lower lung fields together with more or less evidence of chronic pleurisy are the only unusual features of these cases. Pleural manifestations may be limited to visualization of the transverse fissure of the right lung. There is also more or less exaggeration of the linear markings, but the specificity of this reaction is questionable. As shown by Gardner, Durkan, Brumfiel and Saupson,³¹ in cement workers the frequency of such exaggeration tends to increase more with age than with dust exposure. Dreesen, DallaValle, Edwards, Miller and Sayers³¹ concurred but found more of this type of reaction in old asbestos operators than in persons not exposed to dust and less than in those of the same age exposed to kaolin dust. As suggested in the section on pathology, linear exaggeration is probably an accidental accompaniment of asbestosis and in my opinion should not be considered as an index of early reaction to the fibrous silicates.

In far advanced cases there is a heavier diffuse shadow throughout the lung fields, whose appearance has been compared to that of ground glass. Its uniformly fine granular texture is undoubtedly due to the superimposed shadows of the small patches of fibrosis in the parenchyma alternating with patches of radio-translucent patent air spaces. The very advanced case may show in addition many small flecklike shadows on the generally hazy background. The shadows never present the sharp definition of silicotic nodulation. The so-called porcupine heart, said to characterize advanced asbestosis, is manifested by heavy linear shadows that radiate into the lung fields from the surface of the heart. They may be cast by pleuropericardial adhesions.

Clinical Symptoms.—The symptoms most commonly reported are an irritative cough and dyspnea; some would also include weakness and chest pains. A dusky color suggesting cyanosis, clubbed fingers and blood streaked sputum are symptoms of advanced disease whose frequency apparently varies in different locations. Dreesen and his associates³¹ find that cough and dyspnea are by far the most common symptoms and that their frequency increases with the intensity of change visualized in the roentgenogram. Of the patients with far advanced cases 82 per cent had both; of those with moderately advanced cases 72 per cent complained of cough and 68 per cent were short of breath. Since the dyspnea must be due largely to associated emphysema, it is quite conceivable that this symptom should appear early and explain the incidence of dyspnea in 33 per cent of persons whose films showed only second degree linear exaggeration. These observers discovered no greater frequency of cardiac involvement than in industrial groups in general. Others have reached the opposite conclusion, but here again allowances must be made for the source of their material. Theoretically there would seem to be greater reason to suspect cardiac involvement in cases of simple asbestosis than in simple silicosis. Further study is needed to elucidate this point.

Merewether,³² who gave a classic description of this disease, reports that a minimum of seven years' and more commonly eleven years' exposure to high concentrations of asbestos dust was necessary to produce a serious degree of reaction in the English plants. In this country Dreesen and his associates³¹ found the

30. Gloyne, S. R.: *Morbid Anatomy and Histology of Asbestosis, Tubercle* 14: 445-451 (July), 493-497 (Aug.), 550-558 (Sept.) 1933.

31. Dreesen, W. C.; DallaValle, J. M.; Edwards, T. I.; Miller, J. W., and Sayers, R. R.: *A Study of Asbestosis in the Asbestos Textile Industry*, U. S. Pub. Health Bull. 241, 1938.

minimum duration somewhere between five and nine years, depending on the character and concentration of the dust inhaled. At this time 27 per cent of exposed workers were involved, and among those with more than fifteen years of employment the percentage rose to 60.

The question of progression after cessation of exposure has had various answers. Merewether¹⁷ and Ellman³² both believe that asbestosis invariably progresses to a fatal termination once enough fiber has been entrapped in the lungs. The former reports one case in which a mattress maker died eight years after ceasing an employment of four years and five months. An autopsy revealed far advanced asbestosis, but unfortunately there had been no films to indicate the extent of the progression. Mills³³ reported a case in which a man died of congestive heart failure approximately thirty-two years after an intermittent exposure of three years. I was privileged to study sections from this patient, but if there had been any progression it had not involved much of the lungs. There were a few small patches of pulmonary fibrosis containing rare atypical asbestosis bodies. Lanza³⁴ is of the opinion that "it is by no means certain that asbestosis progresses as does silicosis after withdrawal from dust exposure." In experimental asbestosis of guinea pigs the pulmonary reaction retrogresses after removal from the dust rooms. On the basis of mechanical injury there should be no progression, for the rounded surfaces of the asbestosis body would produce less trauma than the rough ends of the freshly inhaled fibers.

Diagnosis depends on a history of adequate exposure, evidence of characteristic roentgenographic changes and the clinical picture. Asbestosis bodies in the sputum are confirmatory but alone they do not indicate disease. Any one may inhale a few asbestos fibers, but their number is too small to be significant. In routine examination of sections of the lung I have discovered occasional asbestosis bodies in a dozen or more cases in which no history of exposure to this dust could be obtained.

Susceptibility to pulmonary infection in asbestosis is not nearly as well defined as in the case of silicosis. English writers like Merewether,¹⁷ Ellman³² and Gloyne³⁰ are impressed by the high incidence of tuberculosis among the disabled patients and those who died. American statistics based on surveys of employees in different plants, on the other hand, show relatively little tuberculosis. Dreesen and his associates³¹ reported only two cases of active infection among 541 persons exposed in the asbestos fabricating plants of North Carolina. However, some 150 employees had been discharged fifteen months previously. Of the latter, seventy-one were examined by Shull,³⁵ who reported eight cases of tuberculosis, only two of which were active at the time. In the entire group "the degree of infiltration was only slight to moderately advanced, and one or both upper lobes were involved." He found that thirty-five of the patients had moderately advanced asbestosis, of whom two subsequently died or were dying of tuberculosis, twenty had far advanced asbestosis with two more cases of tuberculosis. This would make a total incidence of 7.2 per cent for the dis-

charged group. The figure for the entire group of employed and discharged subjects cannot be computed as so many of the latter have not been traced. McPheeters,³⁶ among 210 employees from the same district, found an incidence of active tuberculosis of 2.8 per cent. In Pennsylvania, Fulton, Dooly, Matthews and Houtz³⁷ discovered two cases of healed tuberculosis among fourteen persons with asbestosis. In 1936 Lanza³⁴ summarized all the available evidence and failed to find convincing evidence of a great excess of tuberculosis.

The autopsy statistics are more suggestive. Egbert³⁸ reviewed the cases reported up to 1935 and found that six out of twenty-eight showed complicating tuberculosis. Merewether¹⁷ reports an incidence of 35.7 per cent in forty-two fatal English cases. Dreesen and his associates³¹ include autopsy reports in three cases with no tuberculous complications. My own series, which includes twenty-eight specimens, most of which have been previously reported elsewhere, contains nine cases of active chronic tuberculosis. While these autopsies reveal a high incidence of such infection, their number is too small to compensate for the factor of selection. The data from the surveys probably constitute a more reliable index.

In experimental animals asbestos dust³⁹ has nothing like the effect of free silica on associated infection. Like gypsum, iron oxide and other nonsiliceous minerals, asbestos may cause tuberculous infection to progress for a time, but it subsequently heals with a marked tendency to scar formation. The fibrosis from the infection then retains excessive amounts of inhaled asbestos and unusually large patches of scar develop in the pulmonary parenchyma.

The cause of death in the remaining cases has been certified as nontuberculous pneumonia, myocarditis, pulmonary cancer and a miscellany of other conditions.

Tuberculosis may be an unusually frequent cause of death in certain groups of asbestos workers, but at present it seems more probable that nonspecific hygienic factors and general living conditions are responsible. The actual frequencies of nontuberculous infections and primary cancer of the lungs are unknown. One must not be misled by a comparatively small number of postmortem reports.

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36. McPheeters, S. B.: A Survey of a Group of Employees Exposed to Asbestos Dust, *J. Indust. Hyg. & Toxicol.* 18: 229-239 (April) 1936.

37. Fulton, W. B.; Dooly, Allan; Matthews, J. A., and Houtz, R. L.: The Nature and the Amount of Dust Encountered in Asbestos Fabricating Plants on the Health of a Group of Workers, Commonwealth of Pennsylvania, Department of Labor and Industry, Harrisburg, special bulletin 42, 1935.

38. Egbert, D. S.: Pulmonary Asbestosis, *Am. Rev. Tuberc.* 31: 25-34 (Jan.) 1935.

39. Gardner, L. U., and Cummings, D. E.: Studies on Experimental Pneumoconiosis: VI. Asbestosis, *J. Indust. Hyg.* 13: 65-81 (Feb.) 1931.

Effect of Flying on the Ear.—Flying has no significant effect on the external ear, but the middle and inner ear are the source of a great amount of difficulty. The magnitude of the ear problem in aviation may be judged from the fact that pilots suffer more frequently from occupational disturbances of this organ than from all other occupational diseases combined and that it is the most frequent cause of discomfort among passengers on commercial air lines. The conditions of flight which most affect the ear are changes of atmospheric pressure during ascent and descent, noise, and possibly vibration. At the present time the former is increasing in importance as a result of the increased climbing ability of modern aircraft, while the two latter conditions are decreasing in importance as a result of recent advances in aircraft design. *Principles and Practice of Aviation*, G. Wilkins & Wilkins Company, 1939.

32. Ellman, Philip: Pulmonary Asbestosis: Its Clinical, Radiological and Pathological Features and Associated Risk of Tuberculous Infection, *J. Indust. Hyg.* 15: 165-183 (July) 1933.

33. Mills, R. G.: Pulmonary Asbestosis: Report of Case, *Minnesota Med.* 13: 495-499 (July) 1930.

34. Lanza, A. J.: Asbestosis, *J. A. M. A.* 106: 368-369 (Feb. 1) 1936.

35. Shull, J. R.: Asbestosis: A Roentgenographic Review of Seventy-One Cases, *Radiology* 27: 279-292 (Sept.) 1936.

THE TEACHING OF THE OCCUPATIONAL DISEASES

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LOS ANGELES

It is obligatory that education fulfil the requirements born of a changing social and economic philosophy: that it be harmonious with the constantly altering pattern of vocational needs. While the biologic inheritance of a race remains practically unchanged from age to age, education is always relative to some concrete and evolving social situation. Hence the problem of education assumes one form in ancient Athens, yet quite another in twentieth century America. What was adequate in our fathers' time is now inadequate. It is clear, therefore, that any group charged with the task of shaping the educational theory or practice for any people should consider the trends and interests of the society which it serves. Medical education is no exception to this truth. Although usually deliberate, and in this instance dilatory, it has always met each new exigency. Yet the excision of the old and the implantation of the new have ever been fraught with objections from those members of the medical faculty whose vision has reached the "fixed period." Periodically, inevitable inclusions within the curriculum are met with objections from this group, on the basis that the "course is already overcrowded." No doubt roentgenology, orthopedics, psychiatry and other subjects now taught were once confronted with this same opposition.

Today, seeking admission into the sanctum of clinical teaching comes a knock from occupational diseases, and the urgency of the situation demands that the door be opened to them. Many educators and those who practice medicine outside the fence of industry will wonder why this phase of medicine is apparently receiving sudden emphasis. For these, a brief enumeration of the precipitating factors seems appropriate.

THE LEGAL ASPECT

Workmen's compensation was initiated as an experiment but has since become an established institution, now being in effect in all but two states. Originally designed to compensate for "injuries by accident," the first laws excluded disability not traumatic in origin. Today twenty-two states make provision for all or some occupational diseases. Ominous signs indicate their rapid inclusion by the remaining states. After such enactments the responsibility shifts from a few to all physicians. The existing system of consigning the sudden fracture or laceration to the plant or company physician will continue. In such cases the causative factors are rarely in doubt. But the workman with insidious disease will consult his family or neighborhood physician, on whom will be imposed the duty of determining whether the patient's condition is occupational or nonoccupational in origin. In every city, hamlet, mining center or farming district a workman's ill health will become a medicolegal problem. The foundation for the equitable fixation of liability, therefore, rests on diagnosis. It is apparent that the legal recognition of occupational disease has not been paralleled by the medical profession.

THE MEDICAL ASPECT

The etiology of illness has been abundantly augmented within the past few years. Unto the diseases of

commonalty have been added those which find their cause in dusts, fumes, solvents, metals and noxious gases. Since the World War, the pace set by creative genius in the manufacturing of new products and the devising of new processes has resulted in a dizzy multiplication of hazards. The potentialities represented by 32,000 research workers, now engaged in industrial and consulting laboratories, portend annual additions. In Maryland, for instance, 41,000 workmen may be expected to be exposed to carbon monoxide, 32,000 to organic dusts, 30,000 to metallic mineral dusts, 34,000 to substances apt to produce dermatitis and 8,000 to the inhalation of silica dust. Three fourths of the industrial population studied were subjected to exposure to one or more of the forty-three groups of material listed in the survey. These figures, quoted from bulletin 236 of the United States Public Health Service, may be multiplied many times for those states which are larger industrially. Also certain states have hazards not found, or at least not prevalent, in other states, as for example the synthetic nitrate production in Virginia, the rayon industry in Pennsylvania, the petroleum industry in Pennsylvania, California, Oklahoma or Texas, and the mineral mining in the Western states.

THE EXISTING INADEQUATE SERVICE TO INDUSTRY

The situation would not be so grave if it were confined to the larger industries. Efficient medical supervision as to prevention, diagnosis and treatment prevails in the larger corporations. But the small plant or company employing ten, fifty or 100 men lacks such supervision, although the hazards are just as great. The employer is financially unable to maintain his own medical staff and is therefore dependent on the physician next door or around the corner. It is with the training of this physician that medical education must concern itself.

THE BURDEN ON INDUSTRY AND THE INJUSTICE TO WORKMEN RESULTING FROM ERRORS IN DIAGNOSIS

Do the occupational diseases present a diagnostic problem distinct from that of the ordinary ills of life? If the reader is to obtain an adequate conception of the dissimilarity between general medicine and industrial medicine, let him answer the following question, meanwhile tabulating for his own information the data his research discloses: What are the signs and symptoms attributable to the illness allegedly arising from the occupation of a furrier, fumigator, sand blaster, welder, maker of felt hats, abrasive soap maker, cotton sorter or degreaser (textile); from employment with refrigeration, vulcanizing or photography, or from working with rayon, benzene, cement dust, carbon disulfide, carbon tetrachloride, aniline dyes, pottery, chromium or methyl chloride or with solutions used in electroplating, glass etching or dry cleaning? Having listed these signs and symptoms, state whether the illness is apt to be acute and temporary, without sequelae; sudden, with death ensuing or permanent disability resulting; or insidious, with or without permanent disability.

These are but a few of the exposures in the hundreds of occupations which incorporate potentially harmful materials, processes or environments. Does not the preceding questionnaire indicate the changing complexion of medicine?

THE SOLUTION

Occupational diseases can be taught in practically every medical school in this country, beginning next fall. Offhand, such an assertion appears as an overstatement. True, room cannot be made for them in the present curriculum as easily as one sets an extra plate for the unexpected dinner guest. A separate course will eventually obtain only after progressive readjustment. But the subject can be made an active component of the clinical years by including it in the differential diagnosis during the ward walks or dispensary teaching without discommoding the course. To this, certain voices can be heard saying "But we do this now whenever we have an opportunity." That is not sufficient. It is too casual, too occasional, and characterized by dependence on chance. It would be comparable to studying aortic stenosis only when a case happened to come the way of that particular clinic. Accomplishment of purpose will require a planned, supervised system, together with interdepartmental cooperation. Occupational diseases can be added to the curriculum without additional hours, equipment or particular enlargement of the faculty. I am cognizant of the trend away from didactic teaching. In no way does the proposed plan violate that principle.

The first step in the accumulation of suitable clinical material for demonstration should be the creation of a division of occupational diseases in the outpatient department under the direction of a physician. He should be rich in industrial experience, with a strong sense of the possibilities of correlating the instruction of this kind with the programs of other departments, as for example medicine, dermatology, toxicology, traumatic surgery, and preventive medicine and public health. Once established, such a department could quite conceivably form the basis for the formation of a separate discipline in the medical school for instruction in the wider aspects of industrial health, particularly along graduate lines as the need for specialization clarifies, and to provide means for special investigations. It is not necessary for the director to have had teaching experience, nor need he be expected to teach, but he should have ability to organize. In every center such men are available. His first objective should be to gain the cooperation of the plant and industrial physicians of a community who represent a wide variety of industries. In the suggested scheme this group represents the "department of supply." Monthly meetings with the director, at which time material and methods of presentation are discussed, would constitute a seminar from which would flow an exchange of ideas valuable to the department and instructive to this group of plant physicians. This setup having been established, the office of the director becomes, in the parlance of Hollywood, a central casting bureau. In it will be registered the cases on call, and from it the cases will be assigned to the clinic best suited for their study.

A suspected case of lead poisoning admirably serves to emphasize the advantage of this method of linking teaching with industry. In the present system, isolated from the industrial physician's aid, the student, and too often the teacher, is forced to refer to the standard textbooks of medicine. The following quotation is from a recent volume on the "Practice of Medicine": "The diagnosis of lead poisoning rests upon finding the blue line in the gums and the presence of numerous basophilic cells in the blood smear. Absolute confirmation is obtained by detecting lead in the urine or feces."

How misleading! The blue line isn't necessary and is likely to be absent. Basophilic stippling is not pathognomonic, and lead can be detected in the urine and feces of normal persons. Contrast such insufficient information with the suggested manner of study.

A paint sprayer consults his plant physician regarding recently developed gastrointestinal symptoms which the workman feels are due to lead poisoning. Following a "thorough work-up" the plant physician registers this case in the department of occupational diseases. At a designated time, and bearing the necessary data, he appears before the gastrointestinal clinic. After the consideration of history, including occupational exposure, symptoms and physical examination, the possibilities of ulcer, cancer, gallbladder disease, appendicitis, allergy, neurosis and lead colic are discussed. His laboratory reports are then read, interpreted and compared with normal figures for evidences of lead in the blood smear, whole blood and twenty-four hour urine specimens.

By this method the clinician is supplied, without excessive time or effort on his part, with the essentials for a differential diagnosis. In one period the student learns concretely what constitutes a lead exposure, the distinction between normal lead absorption, abnormal absorption and intoxication, and the criteria necessary for diagnosis.

A rash appearing in the cement or rubber worker will be referred to the section on dermatology and anemia in the dry cleaner to the section on hematology; to the tumor clinic will go the patient alleging his cancer is due to industrial exposure; cough, hemoptysis or dyspnea in one engaged in the dusty trades will be studied by the group concerned with pulmonary diseases, as well as by the class in roentgenology for the consideration of pneumoconiosis. These examples are sufficient to illustrate the scheme suggested.

It is anticipated that there will be those who will consider this plan not feasible, since the workman is not a charity patient. Unquestionably there will be objections from a small percentage of patients. But the material is so abundant that out of the mass there is certain to be a sufficient number of patients from whom cooperation will be gained. The average workman is not a malingerer; he is desirous of obtaining a correct diagnosis and appropriate treatment of his case. I have experienced no difficulty in securing his cooperation in any investigation I have undertaken. It is inconceivable that in every teaching center physicians holding positions comparable to those of Drs. Selby of General Motors, Woody of Standard Oil, Cheney of Armour and Company, Hazlett of Westinghouse, Shoudy of Bethlehem Steel, Bartle of the Pennsylvania Railroad and McConaughy of the Aluminum Company of America would not cooperate in such a plan to supply a constant stream of teaching material to the medical school.

CONCLUSION

I entertain no delusion that the plan suggested should be permanent or is without fault. I am obsessed, however, with the belief that action is imperative. Nationwide legislation imposes a medical responsibility that must be met. Until such time as deletion of certain obsolete courses takes place and room is accorded this subject befitting its importance, the plan herein suggested appears workable and obviously supplants the present hit and miss system.

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ADEQUATE NUTRITION FOR THE
INDUSTRIAL WORKER

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Except for some few special circumstances affecting a minority of the total group, the problem of adequate nutrition for the industrial worker is the nutrition problem of all workers. It is the good fortune of the industrial worker that this is so. The probability that any individual can benefit by each new advance in the science of nutrition and that proper food in adequate quantities can be provided for him depends a great deal on the fundamental similarity in the nutritive needs of individuals.

This is not tantamount to saying that individual variations in nutritive needs can be ignored. Rather, one has to be on guard to find a guiding principle in medicine or nutrition in the maze of physiologic variations encountered in studies of human beings. But isn't it true that the solution of the individual problem in medicine and in nutrition involves starting with a set of rather fundamental general concepts with the avowed purpose of trying to find out the particular degree of variation that needs to be tempered? The boundaries between normal variations and frank derangements in health and nutritive state are indistinct. For this reason the boundaries between the science of medicine and the science of normal nutrition lack real definition. The practical aim of the two sciences, namely to improve the physical welfare of man, is one and the same.

First of all it must be recognized that the term "industrial workers" includes more than $8\frac{1}{2}$ millions of people in this country and many more millions if one looks beyond the borders of this country. Of these $8\frac{1}{2}$ millions of people in the United States who are wage earners in industry, a little more than 20 per cent are women and the rest are men. The range in age covers the whole gamut of the productive years of adult life. If the activities outside of working hours are considered, the range in activity probably encompasses the whole range of activity of humanity. If, therefore, some practical program designed to improve the nutrition of the industrial worker can be arrived at it will certainly be profitable.

ENERGY REQUIREMENTS

In the minds of many persons, industrial work is frequently associated with an extraordinary degree of physical effort, comparable perhaps to that of the athlete in training or of soldiers on a long march. This category includes many workers in the so-called heavy industries, but actually many industrial workers are not called on for heavier physical exertion than the average secretary, housewife, barber or taxi driver. However, the duties of the industrial worker are likelier to be more routinized and monotonous perhaps than the occupations just named. But it would certainly be a mistake to discuss energy requirements of industrial workers in the aggregate.

The task of estimating energy requirements can be greatly simplified by setting the maintenance need for an average man at about 2,400 calories a day and at

about 15 per cent less than this for an average woman. This maintenance allowance presumably meets the energy needs for a person living an ordinary life in a temperate climate without being engaged in manual work. The League's Technical Commission on Nutrition¹ suggests the following additional allowances for muscular activity of adults:

Light work: up to 75 calories per hour of work.

Moderate work: from 75 to 150 calories per hour of work.

Hard work: from 150 to 300 calories per hour of work.

Very hard work: from 300 calories and upward per hour of work.

In assessing the energy requirements, one must not lose sight of the fact that some of the ordinary pursuits of pleasure and relaxation may be hard work in the physiologic sense. Painting and brisk walking are good examples of moderate work. Carpentry, skating, dancing and bicycling are typical examples of hard work. Sawing wood, digging, stone masonry, running and swimming are very hard work in the sense that they require rather enormous rates of energy expenditure. To assess fairly a worker's energy needs, therefore, it is necessary to consider the expenditures of energy beyond the fixed working hours, because chores and sports may affect the need very appreciably.

A great deal has been written about fatigue in industry. Strictly speaking, muscular fatigue connotes a state within the muscle fibers wherein the recovery processes during exercise have not kept pace with the processes of breakdown. An oxygen debt is built up which can be relieved by rest. If the muscle fibers lacked this ability to take on an oxygen debt temporarily, no physical effort of any considerable severity could be made. The term "industrial fatigue," however, is more generally used as referring to the lessened capacity or inclination to do work which results from the previous doing of work of the same kind. Proper nutrition is one of the factors essential to the promotion of maximum efficiency of workers. There are, of course, many other factors involved as well.

Haggard and Greenberg² have reported a distinct rise in muscular efficiency after meals which they associate with an increased utilization of sugar. In their experiments, muscular efficiency followed rather closely the changes in sources of energy as reflected in the respiratory quotient. The body possessed the capacity to do physical work efficiently when the respiratory quotient was at a value between 1.0 and 0.85, while below 0.85 the efficiency was observed to be low, approaching the before breakfast condition. This suggested that when sugar was being used as the source of energy for work the work was less difficult than when fat was being used. It should be mentioned that Haldi and his co-workers³ were unable to confirm these observations, and no rational explanation has been offered to reconcile these two sets of experiments. However, Haggard and Greenberg's original contention appears to be supported by results of its practical application to the productivity of factory and office workers. For several obvious reasons, the feeding of sugar alone to workers at frequent intervals every day would not be a commendable practice; however, there

1. League of Nations, Health Organization: *The Problem of Nutrition*, vol. 2. Report on the Physiological Bases of Nutrition, League of Nations Publications, series II, B 4, Geneva, 1936.

2. Haggard, H. W., and Greenberg, L. A.: *Diet and Physical Efficiency*, New Haven, Conn., Yale University Press, 1935.

3. Haldi, John; Bachmann, George; Ensor, Charles, and Wynn, Winfrey: *Muscular Efficiency in Relation to the Taking of Food and to the Height of the Respiratory Quotient Immediately Before Exercise*, *Am. J. Physiol.* 121: 123-129 (Jan.) 1932.

is no violation of the principles of good nutrition in the use of more frequent meals if the sum total of food intake is thereby not made excessive and if the requirements of a well balanced diet are met.

These same investigators have described a study of between meal feedings made in a large industrial plant manufacturing rubber footwear. They selected from a series of unit operations that of sewing together (by machine) the canvas parts of the tops of tennis shoes. Rows of operators could take from a conveyor belt, as needed, baskets filled with unassembled tops, sew them together and replace the baskets, together with a slip giving the operator's number. The wage system provided a minimum hourly wage plus an additional sum based on rate of production. The hourly production of the individual operators was recorded from the number of assembled shoe tops returned to the baskets placed on the conveyor. A sustained hourly rate of production was strikingly apparent for operators accustomed to eating food in the third hour of the morning and afternoon working periods (five meals in all) as compared with those eating only two or three meals a day. The productivity of another group of operators accustomed to three meals a day improved very significantly when given in addition light lunches of milk and "angel cake" at the beginning of the third hour of the morning and afternoon working periods. The operators also volunteered the information that they felt less tired on those days when they had five rather than three meals.

Haggard and Greenberg⁴ have recently reported a controlled study of the effects of between meal feedings of bananas or milk and bananas during previously established rest periods on the disposition and absenteeism of a group of 120 clerical workers in a large commercial office. There was a marked decrease in absenteeism among the employees receiving these two daily supplementary lunches. Most of the employees approved of the supplementary food and thought that they became less tired and were kept in better spirits and were more attentive to their work.

These investigators believe that it is entirely possible for persons to be relieved of a feeling of fatigue, irritability and muscular inefficiency by frequent feeding and at the same time to satisfy the requirements for a well balanced diet without overeating. Probably most of those participating in this congress could bear witness to the fact that hunger is associated with weakness, irritability, diminished ability to concentrate and disinclination for sustained work. If a daily diet of the same quantities of a well balanced selection of food eaten in five meals instead of in three meals will make persons happier and more effective, why not? The opposition will cling to two main objections—the stomach needs rest and the habit of three meals a day is firmly entrenched. Well, if one is really honest about it, isn't it the oversized meal that puts the burden on digestion and makes one dull and listless? For the gastric ulcer patient, the invalid and the convalescent, the frequent small meal is very regularly advocated—what about rest for the stomach in these cases? For those who resist change that seems to offer possibilities for betterment merely because it disturbs an established routine, neither science nor reason has an answer. This proffered change in mealtime frequency has enough basis in experimental background to warrant further

trial in practical application as a possible means of promoting the health and cheerfulness and productivity of millions of workers.

PROTEIN REQUIREMENTS

Rose and his co-workers⁵ at the University of Illinois have recently isolated and identified a new amino acid which they named d-threonine. As a result of this discovery it is now possible for the first time to rear animals on diets containing mixtures of known amino acids instead of proteins.

Of the twenty-two or more known amino acids, nine or ten must be considered as indispensable. That is to say, nine or ten cannot be synthesized by the body at all or not at rates sufficient to supply adequately the body's needs for them. The amino acid arginine, for example, can probably be synthesized in considerable amounts in the body but not at a sufficiently rapid rate to support normal growth. Methionine, a sulfur-containing amino acid, is one of the indispensable amino acids, while cystine, a sulfur-containing amino acid prominent in the composition of hair and nails, apparently is not. However, diets low in methionine can be enhanced with respect to their growth-promoting properties by the addition of cystine. It seems, therefore, that methionine is essential for certain bodily functions which cystine cannot satisfy but that in certain other functions cystine can spare methionine.

It is not known at present whether or not a deficiency of each one of the indispensable amino acids in the diet produces a specific syndrome. Specific amino acid deficiencies is one of the new problems awaiting the solution for which the work of Rose and his associates has pointed the way.

The day may not be too far distant when scientists will be able to speak of specific amino acid requirements rather than lumping these all together indeterminately as a protein requirement. It is well recognized that proteins from natural food sources vary widely in their amino acid makeup. Because the proteins from animal sources are richer in many of the essential amino acids than the cereal and vegetable proteins, the former proteins are spoken of as having higher nutritive value. Plant proteins in general are much lower in the indispensable amino acid lysine than animal proteins. It has also been established that higher intakes of lysine are necessary to support normal growth in small animals than of any other of the indispensable amino acids. Because the freely chosen diets of individuals vary so widely in combinations of proteins, it is important to allow a liberal margin of safety on protein intake, hoping thereby to secure adequate amounts of all the essential amino acids. It is also imperative to recommend that milk, meat, eggs, cheese and fish supply a good proportion of the protein allowance. For the average adult it would appear that equal amounts of protein from animal and vegetable sources were a very favorable source-distribution.

Many authorities have accepted a daily allowance of 1 Gm. of protein per kilogram of body weight (or 70 Gm. for a man) as probably representing a reasonable margin of safety for the protein requirements of adults. Other authorities tend to regard this quantity as "not

4. Haggard, H. W., and Greenberg, L. A.: Between Meal Feeding in Industry: Effects on Absenteeism and Attitude of Clerical Employees, *J. Am. Dietet. A.* 15: 435-539 (June-July) 1939.

5. McCoy, R. H.; Meyer, C. E., and Rose, W. C.: Feeding Experiments with Mixtures of Highly Purified Amino Acids: VIII. Isolation and Identification of a New Essential Amino Acid, *J. Biol. Chem.* 112: 283-302 (Dec.) 1935. Rose, W. C.: The Nutritive Significance of the Amino Acids and Certain Related Compounds, *Science* 86: 298-300 (Oct. 1) 1937.

liberal" at least. Leitch⁶ recently presented a reevaluation of the experimental results dealing with nitrogen balances and concludes that the allowance should be on the order of 80 Gm. per adult daily to provide a 50 per cent margin of safety. McCollum and his co-authors⁷ of the recently revised "Newer Knowledge of Nutrition" place the adult daily allowance for protein at around 110 to 120 Gm.

Another aspect of this question should be mentioned here. Foods rich in protein of the best biologic value are, in the United States, among the more expensive types. Stiebeling and Phipard⁸ have shown that as the wage earners' expenditures for food increase, more money regularly goes toward the purchase of protein-rich foods. Apparently most adult wage earners much prefer a diet that provides around 110 to 120 Gm. of protein daily. It appears to be the cost that deters them when they consume less protein than this. There is very little evidence to indicate from a physiologic standpoint that adults should not consume from 110 to 120 Gm. of protein a day if it pleases them. The idea that high protein intake places an extra burden on the kidneys with resultant injury to their function and structure lacks real justification. There is no indication that the changes in these organs of normal animals fed on diets abnormally high in proteins are anything more than a normal physiologic response to increased functional demands.

The distribution of potential calory foods in most American diets is apportioned with about one eighth of the calory value from protein, one third from fat and the remainder from carbohydrate. If approximately the same relative proportions of these three nutrients are maintained throughout the range of adult requirement for total calories the result will be a very good balance among these three important nutrients; the protein requirement will be adequately met and the worker pleased. The protein, however, should be supplied at all levels of intake in the form of a variety of animal and plant foods in order that all the indispensable amino acids shall be adequately represented.

INORGANIC ELEMENTS

The human body and the foods on which it is dependent contain a wide variety of inorganic elements. Some of the inorganic elements, notably calcium, phosphorus, sodium, potassium, chlorine, iron, magnesium, iodine and sulfur, are present in and required by the body in rather substantial amounts. Besides these, some very small quantities of other elements are essential to normal life processes. The list of recognized essential trace elements is gradually growing in numbers. Many elements, however, have not yet been subjected to a crucial test adequate to determine whether or not they should be added to the list of indispensable food elements. There is still a great deal to be learned about the functions of all the inorganic elements essential to good nutrition.

Fortunately many of the essential inorganic elements are so widely distributed in plant and animal foods that there is little danger of a real shortage of them in the varied diet of human beings. The experimental feeding of animals has been the tool by which the indispensabil-

ity of many inorganic elements was discovered. Our present knowledge of the vitamins presents a similar situation. For these reasons nutritionists are agreed that man should provide himself with a wide variety of foods. In so doing the nutritionist endeavors to make certain that nothing indispensable to good nutrition shall be lacking. This is the only means at hand to safeguard the present lack of knowledge of how to compound a thoroughly adequate diet from chemically known substances. This appeal for variety in food selection is an appeal to sound common sense in view of the limitations of our knowledge of nutrition. There is no jest in this advice. The monotonous undiversified diets the world over are those most frequently associated with nutritional deficiency diseases. The medical profession should be on its guard against the long continued use of such diets in the treatment of special diseases.

Of the recognized nutritionally essential inorganic elements, calcium, phosphorus, iron and iodine need special attention because optimal amounts of these are least likely to be provided by hit and miss methods of food selection. The body adapts itself to a rather amazing extent to low intakes of these elements and conserves in large measure the allowances provided. But many times this is a forced and compromising adaptation that only softens or postpones the period of nutritive failure. Inadequate calcification of the skeleton of adults is a good example of this. The pliable bones of young children and the well calcified skeletons of adults can withstand amazing impacts of force without giving way to breaks or fractures. But almost every physician knows many adults who suffer these troubles as a result of insignificant little jolts or tumbles, particularly adults of middle age or beyond. Perhaps some of this is due to decreased secretion of certain hormones, but it is quite likely that much of it is due to their settling on a diet too largely of toast, tea and a little cake. If the body is forced to lose a little of its calcium and phosphorus day after day the time must come when the rarefaction of the bone makes it a very weak structure. It is a relatively simple matter to keep the skeleton well calcified once it is so, but of the possibility of recalcifying an adult skeleton that has lost a lot of its calcium and phosphorus I am not so certain. It is quite clear that further light is needed on this matter. For the present, the best advice that can be offered is to supply the body with liberal amounts of calcium and phosphorus as the bone develops the new structures in which these elements can be deposited and to keep right on supplying about 0.7 Gm. of calcium and about 1.3 Gm. of phosphorus daily thereafter. If the skeleton is already rarefied in inorganic elements, these quantities of calcium and phosphorus will at least prevent further rarefaction as far as proper food can protect this. A weak skeleton is a hazard in the ordinary pursuits of living as well as in the industrial occupations.

Among the common food items, not one is superior to milk as a source of calcium and phosphorus. A pint of whole or skim milk a day for every adult or the equivalent of this in the form of evaporated or dried milk would be of tremendous help in sustaining a good nutritive state in adults. And there is no need to parry the question of how to use it, for that is hardly worth the candle—consume it as you will. The popular excuse of many adults for evading the use of milk is that it makes one fat. A pint of milk carries approximately

6. Leitch, I., and Duckworth, J.: The Determination of the Protein Requirements of Man, *Nutrition Abstr. & Rev.* 7: 257-267 (Oct.) 1937.

7. McCollum, E. V.; Orent-Keiles, Elsa, and Day, H. G.: The Newer Knowledge of Nutrition, ed. 5, New York, Macmillan Company, 1939.

8. Stiebeling, Hazel K., and Phipard, Esther F.: Diets of Families of Employed Wage Earners and Clerical Workers in Cities, U. S. Department of Agriculture, circular 507, January 1939.

300 calories and no flight of the imagination is going to make it any greater. A pint of milk is no match for calories as compared with most customary desserts. There would be no better way to improve the nutritive state of industrial workers than to see to it that each one gets at least a pint of clean pasteurized milk a day.

An iron intake of from 10 to 15 mg. a day for a man or woman has been widely used as a guide to planning adequate diets. Further knowledge about the variations in the availability of the iron in different foods has added some new problems to the evaluations of iron requirements. In the average American diet the principal sources of iron are eggs, leafy green vegetables, lean meats, mature beans and peas, and whole grain cereals.

able iodine also provide appreciable amounts of the iodine needed by man. The regions in which iodine deficiency is common are now generally known, and this condition can be treated prophylactically by the use of iodized salt or administration of potassium iodide under adequate medical supervision. Orr and Leitch,⁹ having reviewed the meager data at their disposal on actual iodine requirements, estimate therefrom that adults probably need around 0.045 mg. of iodine daily. The thyroid gland has the capacity to store iodine administered in excess of daily requirements, so that if it is necessary to administer iodides this need not be done often.

The one requirement for inorganic elements of special concern to certain groups of industrial workers is that

TABLE 1.—*A Good Low-Cost Diet**

Family Members	Kinds and Quantities of Foods for a Year											
Description	Milk, Quarts	Potatoes, Sweet Potatoes, Pounds	Toma- toes, Citrus Fruits, Pounds	Leafy, Green, Yellow Vegetables, Pounds	Mature, Dry Legumes, Nuts, Pounds	Other Vegetables, Fruits, Pounds	Eggs, Dozen	Lean Meat, Poultry, Fish, Pounds	Flour, Cereals, Pounds	Butter, Pounds	Other Fats, Pounds	Sugars, Pounds
Children under 2 years.....	260	80	65	80	...	...	18	...	50	7	..	3
Children 2 to 3 years.....	365	90	65	130	...	40	22	15	80	10	..	7
Boys:												
4 to 6 years.....	365	100	65	130	7	75	22	25	100	15	..	15
7 to 8 years.....	260-365	120	65	180	10	100	22	65	140	20	3	25
9 to 10 years.....	260-365	130	65	200	10	140	18	80	160	20	20	40
11 to 12 years.....	260-365	140	65	200	15	140	18	90	180	20	20	40
13 to 15 years.....	260-365	160	65	160	15	175	18	100	230	20	30	50
16 to 19 years.....	260-365	220	65	160	15	175	13	140	310	20	40	65
Girls:												
4 to 7 years.....	365	100	65	130	7	75	22	25	100	15	..	15
8 to 10 years.....	260-365	120	65	180	10	100	22	65	140	20	3	25
11 to 13 years.....	260-365	130	65	200	10	140	18	80	160	20	20	40
14 to 19 years.....	260-365	140	65	200	15	140	18	90	180	20	20	40
Men 20 years and over:												
Very active.....	180	300	65	160	25	175	13	160	420	20	60	80
Moderately active.....	180	160	65	160	20	175	13	130	230	20	30	65
Sedentary.....	200	140	65	180	10	140	18	90	160	20	20	40
Women 20 years and over:												
Very active.....	180	160	65	180	15	175	18	100	230	20	30	65
Moderately active.....	180	140	65	180	15	165	18	90	180	20	20	50
Sedentary.....	200	100	65	180	10	140	18	90	120	20	20	40
In pregnancy.....	365	140	65	250	10	200	22	90	170	20	20	40
In lactation.....	365	170	65	230	10	230	22	100	210	20	50	50
Yearly total for family.....	.....	.....	..	...	..	...	..	...	...	..	..	..
Monthly total (divide by 12)...	.....	.....	..	...	..	...	..	...	...	..	..	..
Weekly total (divide by 50)...	.....	.....	..	...	..	...	..	...	...	..	..	..

* From the 1939 Yearbook of Agriculture (Food and Life).

The body naturally has nothing to gain by the ingestion of unavailable forms of iron, so that analysis of the total iron in foods is of small help unless it is also known what proportion of such iron is available. The allowance of from 10 to 15 mg. of iron for adults was based on studies of iron balances; the iron absorbed from the food could have been none other than available iron. As a result of more recent studies this allowance appears to be generous. In consideration of what data there are about the availability of iron in different foods, it would appear that the provision of from 10 to 15 mg. of total iron in the form of a mixed diet of natural foods would probably meet the more recently established estimates of an adult's iron requirements.

Ingestion of generous amounts of sea food is one way to provide for an adequate intake of iodine. The iodine in sea food is absorbed by marine organisms from the sea water, which contains about 25 parts per million of iodine. In the case of certain marine fishes, ingestion of seaweed, a very rich source of iodine, accounts for further accumulations of iodine in such fish. Drinking water and vegetation grown on soil containing avail-

able sodium chloride. The average adult ingests from 10 to 20 Gm. of sodium chloride daily, the major portion of which is added as seasoning for foods. Hard work accompanied by profuse sweating or exposure to excessively high temperatures and low humidities, such as in furnace rooms, may readily lead to serious salt depletion accompanied by "heat cramps." The individual variation in salt concentration of sweat is very large. A man working under conditions involving profuse sweating may lose 8 or 9 liters of sweat in one day. If the sweat is of high salinity, the loss of salt could be on the order of 30 Gm. During acclimation of men to high temperatures, the salt concentration of the sweat is high the first few days and may decrease by more than 50 per cent during adaptation to such an environment. It is important, therefore, that new men engaged to work in an excessively hot environment be given plenty of extra salt from the start. A 0.1 per cent solution of sodium chloride in water at about 46 F. was found to

9. Orr, J. B., and Leitch, I.: Iodine in Nutrition: A Review of Existing Information, Special Report Series No. 123, Medical Research Council, London, His Majesty's Stationery Office, 1929.

be very acceptable to men working in a high temperature environment at the Youngstown steel mills and was very successful as a prophylactic for heat cramps. The volume of sweat lost as a result of continued occupation at a job involving work in high temperature environments is changed but little as time goes on. This loss of water needs to be replaced, and Talbott and

TABLE 2.—*A Good Low-Cost Diet: Approximate Quantities Needed for One Week for Specified Individuals**

	Unit of Measure	Moderately Active Man, Quantity	Moderately Active Woman, Quantity	Boy, 8 Years, Quantity	Girl, 5 Years, Quantity
Flour, cereal f.....	Pound	4½	3½	2¾	2
Milk (or its equivalent).....	Quart	3½	3½	5	7
Potatoes, sweet potatoes.....	Pound	3	2¾	2¼	2
Dried legumes, nuts.....	Ounce	6	4	3	2
Tomatoes, citrus fruits.....	Pound	1¼	1¼	1¼	1¼
Leafy, green, and yellow vegetables.....	Pound	3	3½	3½	2½
Dried fruits.....	Pound	¼	¼	¼	¼
Other vegetables and fruits.....	Pound	2	1¾	1¼	¾
Butter.....	Ounce	6	6	6	4
Other fats.....	Ounce	10	6	1	...
Sugars.....	Pound	1¼	1	½	¼
Lean meat, poultry, fish.....	Pound	2½	1¾	1¼	½
Eggs.....	Number	3	4	5	5

* Based on the Yearbook of Agriculture, 1939, page 335.

† Count as 1 pound of flour each 1¼ pounds of bread purchased.

Coombs¹⁰ recommend that salt be given, at least to the extent of 15 Gm. a day, in addition to that contained in the diet, but that no attempt be made to limit water intake.

VITAMIN REQUIREMENTS

Altogether too much dramatic effort has been released on the subject of vitamin deficiency diseases and on the benefits purported to accrue from ingestion of large amounts of vitamin preparations. The general public has generously responded with purchase of vitamin concentrates to the extent of a money outlay of not less than \$100,000,000 during the past year. There are cases of vitamin deficiency diseases in the United States, but by far the larger proportion of these unfortunate persons are among those who have not and could not afford to buy vitamin concentrates.

For the treatment of vitamin deficiency diseases, the use of vitamin concentrates is amply justified. Some of these diseases are associated with diminished capacity to absorb vitamins normally when administered orally. In such cases appropriate routes of injection are clearly indicated.

From our present knowledge of the composition of foods, it seems almost impossible that a person could contract a vitamin deficiency disease without having subsisted for a considerable time on a diet inadequate in several respects at one and the same time. The inadequacies are not even limited to the recognized vitamins. An analysis of the diets of pellagrins, for example, reveals that their diets have been wretchedly inadequate in many respects. The only sound and permanent solution to the problem of malnutrition is to educate the people and adjust the economic situation so that everybody can share the benefits of a steady, well balanced diet. To do this occasions the need for a much larger consumption of the so-called protective foods—eggs, dairy products, tomatoes, citrus fruits and leafy green vegetables. There is no known substitute for a steady, well balanced diet carrying liberal quantities of the pro-

tective foods. Such diets will provide all the known essential food nutrients in adequate amounts and in addition furnish some measure of safety against inadequacies of essentials about which there is at present no knowledge. It is absolutely certain that all the essential food factors have not yet been discovered.

Although there are many published estimates of the human requirements for several of the well known vitamins, the scientific basis for these estimates leaves much to be desired. This situation is inevitable when one stops to consider that the criteria for recognizing borderline states of vitamin deficiencies are entirely lacking in the case of some of the well known vitamins. Probably no one is entirely satisfied that such criteria as have been employed are adequate for the purpose. Under these circumstances the best that can be done is to suggest tentative allowances that embody liberal margins of safety. Such daily allowances for an adult would be something on this order:

Vitamin A, from 5,000 to 6,000 international units.

Thiamin, from 1 to 2 mg.

Ascorbic acid, from 60 to 70 mg.

Vitamin D, unknown.

Riboflavin, from 1 to 2 mg.

The estimate for vitamin A provides some margin of safety over the amount required to restore normal dark adaptation in adults exhibiting mild degrees of night blindness. The estimate for thiamin provides around a 100 per cent increase over that of diets which barely prevent mild degrees of beriberi. The estimate for ascorbic acid is probably at least twice the amount that will prevent recognizable signs of scurvy. In the case of thiamin and ascorbic acid one ought probably to aim at the upper limits of these allowances so that cooking losses for these heat-labile vitamins do not reduce the actual intake below the lower limit. Vitamin D is undoubtedly necessary for adults, probably in considerably lesser amount than children require, but there is no basis for a quantitative estimate. The riboflavin

TABLE 3.—*A Good Low-Cost Diet: Approximate Nutritive Values Daily for Specified Individuals**

	Unit of Measure	Moderately Active Man	Moderately Active Woman	Boy, 8 Years	Girl, 5 Years
Food energy value.....	Calories	3,070	2,510	2,130	1,730
Protein.....	Grams	95	78	76	66
Fats.....	Grams	117	94	82	68
Carbohydrates.....	Grams	409	338	271	211
Calcium.....	Grams	0.92	0.88	1.10	1.56
Phosphorus.....	Grams	1.54	1.33	1.12	1.49
Iron.....	Milligrams	15.4	19.3	12.3	9.4
Vitamin A.....	Int. units†	9,000	9,600	9,700	7,700
Vitamin B.....	Int. units†	610	520	540	440
Ascorbic acid.....	Milligrams	80	80	70	60
Riboflavin.....	Sherman units	720	660	730	500

* Adapted from Yearbook of Agriculture, 1939, page 335.

† International units.

estimate is pretty much a surmise, based on quantities that accompany diets adequate in other known food essentials.

For the remainder of the recognized vitamins there are no general estimates for requirements.

A PRACTICAL GUIDE TO PLANNING ADEQUATE NUTRITION FOR THE INDUSTRIAL WORKER

It is all very well to discuss the nutritive needs of the industrial worker in terms of energy, protein, inorganic elements and vitamins, but embodying all this knowledge into a simple practical plan is quite another

10. Talbott, J. H., and Coombs, F. S.: Certain Aspects of Mineral Requirements. J. Am. Dietet. A. 15: 631-638 (Oct.) 1939.

matter. At this point it must be remembered that the industrial worker is usually a member of a family group who eat together at the same table. In addition, any practical diet plan must take into account the fact that families have some preferences in the choice of foods; the plan must be adjusted to fit the pocketbook, and the food should be attractive and pleasing.

The foods common in this country can be classified into about a dozen major groups. Suitable quantities of foods in these several groups can be combined to provide adequate nutrition over a period of a year, a month or a week for individuals of different age, sex and activity. Of course many combinations of these twelve major food groups can be worked out so that all the nutritive requirements which have been discussed in this paper will be amply provided. As an example of such a combination, table 1 shows the respective quantities of food in each group that will provide these nutritive essentials over a period of one year, listed opposite the descriptions of each type of family member. This particular combination of major food groups is one that can be provided at a relatively low cost. When the family composition is known it is a simple matter to read off in each of the twelve columns the quantities of foods that will supply the nutritive needs of individual members of the household. Simple addition of these quantities will provide the totals required by the family during the period of one year. If each of the sums is divided by 12 the results will give the quantities of foods in each major food group required by the family for one month; if divided by 50, the result is the approximate weekly quantities needed by the family.

If a family consisted of one moderately active man, one moderately active woman, a 5 year old daughter and an 8 year old son, this family's food requirements could be adequately met by weekly supplies of the kinds and quantities of foods (shown separately for each member of the family) indicated in table 2. These weekly allowances of food provide for the approximate daily intake of calories, protein, fat and carbohydrate as well as certain minerals and vitamins in the quantities shown in table 3.

The weekly cost of this food for these four persons would vary somewhat depending on current prices of food in the particular locality in which the family lived. According to prices reported in 1935-1936 by families of wage earners and clerical workers living in a wide range of localities in the United States, with adjustments made in accordance with trends in price levels obtained from the Bureau of Labor Statistics, this family's total food bill for one week during the period January to October 1938 would have varied (depending on the locality) between \$6 and \$9.50.

This diet plan provides for choice in eight of the twelve food groups as to which particular foods in the group the family elects to eat. For reasons discussed earlier, the family is urged to introduce as much variety as possible in its choices within those food groups which provide for choice. According to surveys based on about 4,000 records of weekly food consumption, Stiebeling and Phipard⁸ report that approximately 50 per cent of employed wage earners and clerical workers in various cities of the United States actually spent enough money for food to obtain diets of this nutritive quality. Although they actually spent enough money to get a diet as good as the one suggested in table 1, the actual food selection of many of these families was such that the nutritive value fell short of this plan. The remain-

ing 50 per cent did not spend enough money to obtain a diet with as good nutritive value as that suggested for a good low-cost diet in table 1. The practical problem of good nutrition is often, as was shown in these studies, a combination of educational and economic factors.

The plan of food selection outlined in table 1 is offered merely as a sample plan to show how the industrial workers and their families might solve the problem of adequate nutrition without undue expense.

PRESENT STATUS OF BENZENE

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In order to dispel any confusion concerning the present status of benzene, it is necessary to have a very definite differentiation between benzene and benzine.

Benzene (benzol C_6H_6)¹ is a single chemical substance obtained by distillation of coal tar and is purified by redistillation at from 70 to 80 C. Gasoline, or benzine,² is obtained from the distillation of petroleum and is a mechanical mixture of hydrocarbons ranging from C_5H_{12} to C_6H_{14} . Its composition varies according to the boiling point. At 36.3 C. it contains from 60 to 70 per cent of pentane, C_5H_{12} . Substances distilling between 30 and 70 C. produce what is commonly called gasoline.

Benzene is obtainable in several grades in commerce:

1. Benzene: Chemically pure (U. S. P. XI, p. 85) 95 cc. distils between 79.5 and 81 C.

2. Benzene 90 per cent: This is 90 per cent of the distillate up to 100 C. Composition from 80 to 85 per cent benzene, from 13 to 15 per cent of toluene, 2 or 3 per cent of xylene and 1 per cent heavy residue.

3. Benzene 50 per cent: This is 50 per cent of the distillate below 100 C., 90 per cent below 120 C. Composition from 45 to 50 per cent benzene, heavy residue of olefins, paraffins and complex bodies and some toluene.

4. Solvent naphtha: Consists chiefly of xylene, a small amount of toluene and thiophene.

A thorough knowledge of the difference between benzene and gasoline will, I believe, explain the diminishing number of cases of poisoning by the volatile hydrocarbons of the benzylic series. Benzene, toluene, xylene, naphthalene, anthracene and phenanthracene belong to the benzylic series and contain one or more carbon rings. Gasoline, on the other hand, does not belong to this series but to a lower unsaturated carbon-hydrogen combination commonly called the marsh gas series.

Pure benzene is a chemical entity, while all gasolines vary over wide ranges in composition. Commercial benzene has the following impurities in varying amounts: xylene, toluene, phenol, thiophene, carbon bisulfide, acetonitrile, pyridine and traces of many other substances.

Gasolines have no definite composition; for example, gasoline from Pennsylvania contains pentane, hexane, heptane and paraffins while gasoline from California and Texas contains cyclopentanes, cyclohexanes and cycloparaffins.

Read before the Section on Preventive and Industrial Medicine and Public Health, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Benzene (C_6H_6 or PhH = 78.08; benzol [German], benzole [French] phenylhydride, cyclohexatriene, phené) is a colorless liquid or crystals with a density at 20 C. of 0.879, melting point 5.4 C., boiling point 80.3 C., insoluble in water and miscible with alcohol and ether, acetone and glacial acetic acid.

2. Benzine, or gasoline, is a mixture of hydrocarbons obtained from the second portion of the fractional distillation of crude petroleum which consists of the fraction boiling between 70 and 90 C. A clear colorless liquid with a density of from 0.640 to 0.675.

USES

Benzene has the following uses:

1. As a solvent for paints, lacquers and varnish, rubber and fats.
2. In color printing.
3. As a cleaning agent for clothes.
4. As a motor fuel.
5. In the chemical manufacturing industry.

Both benzene and gasoline are poisonous but benzene is quicker in its action, and the intensity is much greater. There are three avenues of entrance of benzene into the body: (1) the respiratory system, (2) the alimentary system and (3) the skin.

It is my opinion that in from 90 to 95 per cent of cases the benzene enters by way of the respiratory system, the incidence of cutaneous absorption being very small except in those cases in which the hands and arms are immersed in solutions containing a large percentage of benzene or when the hands are washed in benzene to remove grease and rubber. This procedure, however, should be condemned.

Absorption by way of the alimentary system is not great but often occurs when materials are introduced into the mouth or food that has been in the same room with the benzene is eaten or tobacco that has been exposed to benzene fumes is put into the mouth. A small percentage of benzene is dissolved in the mucous secretions of the mouth and throat and swallowed. The greater the concentration of the fumes, the greater the amount absorbed by the skin and the alimentary tract, but under controlled conditions these two avenues of absorption are practically negligible.

The human system can tolerate minute amounts over a period of many months if proper aeration and elimination are instituted. In other words, a small factor of immunity develops through an equilibrium between intake and output of absorbed material. Just as soon as a minute increase of intake over output develops, symptoms begin to appear.

The following clinical symptoms seem to me to be the most predominating after observing and examining between 6,000 and 7,000 men and women who have worked with the various compounds containing benzene or its homologues for the last twenty years:

1. Peculiar brackish taste.
2. Slight giddiness.
3. Unsteady vision and slight headache.
4. Nausea and vomiting.
5. Dizziness, "benzene jag," odor of benzene.
6. Weakness. Benzene breaks down the body defense against acute infections and many secondary conditions develop, such as (a) gingivitis, (b) boils, (c) pustular conditions of the skin, (d) frequent colds, (e) arthritis and (f) infections of the gastrointestinal tract. Hektoen has done much work on the effect of benzene on antibody formation.
7. Increased nervousness with increased pulse, nosebleed, uterine bleeding, bleeding from the gums.
8. Slight temporary increase in blood pressure.
9. Excessive fatigue at the end of eight hours' work.
10. Marked tremors of the hands.
11. Loss of equilibration in the dark.
12. Gastric and intestinal disturbances.
13. Paresthesia—numbness, tingling.
14. Insomnia—in the first stages drowsiness and in later stages insomnia.
15. Loss of weight, benzene pallor.
16. Benzene purpura, nosebleed, anemia.

17. Menstruation every two or three weeks by female employees.

18. Dermatitis.

19. Nephritis.

20. Labored respirations and coma.

With reference to anemia under paragraph 16, it may be said that many thousands of blood counts have shown that this is one of the main factors that the industrial physicians must rely on to show the effect of benzene on the individual. There first develops a slight leukocytosis, later a slight leukopenia, and erythropenia with a slight reduction in hemoglobin content. With increased absorption this progressively gets worse, and the following develops:

1. Increased leukopenia.
2. Increased erythropenia.
3. Lymphocytosis.
4. Development of few transitionals. A point is reached when the blood forming organs are nearly suppressed and the new cells do not form rapidly.
5. Decrease in coagulation, caused by a decrease in prothrombin and thrombin.
6. Decrease in blood calcium.
7. Decrease in antibody formation.
8. Severe decrease in hemoglobin formation with increase of hematin in the urine and decrease in blood platelet formations.
9. The beginning of endothelial lining cells to appear in the blood stream. The appearance of these cells indicates the serious if not the fatal stage of poisoning.
10. Complete cessation of formation of new blood cells.

I have observed in a few cases a condition of vacuolation in the leukocytes, but this is not a constant factor. It probably is due to the inability of the cells to retain fatty compounds, and I believe that fatty substances are either extracted or prevented from forming in the nerve tissue, thus producing the nervous complex. The effects of benzene are accumulative, more lasting and more severe than those of gasoline.

Temporary exposure to slight concentrations of benzene or gasoline are transient, and complete aeration causes the effects to disappear. It is the constant absorption of small amounts daily that produces the detrimental effects.

In October 1935 Yant and Sayers and their associates⁴ presented a new method for controlling exposures to benzene by the determination of urine sulfates. Since Dr. Yant and his associates advocated this method of detection of the absorption of benzene, I have inaugurated it as a routine procedure for all patients who work with benzene. During the last ten months I have studied 650 workers with the inorganic sulfate method in conjunction with blood work, physical examinations, analysis of the air and any other clinical examinations which I thought might throw some light on this method. From my experience I have found several factors, which I shall mention:

1. In most industries using large quantities of benzene the fire hazard is great; when it is possible, some other solvent is combined with benzene to reduce the flash point of the benzene. The nature of the solvent determines the accuracy of the test. For example, carbon tetrachloride is often used; it causes the opposite effect from benzene on the sulfates and therefore, unless there is an extreme reduction, the results are not useful as a diagnostic factor. Ethylene dichloride is another solvent that is used with benzene and changes the results.

4. Yant, W. P.; Schrenk, H. H.; Sayers, R. R.; Horvath, A. A., and Remhart, W. H.: *J. Indust. Hyg. & Toxicol.* 18: 69 (Jan.) 1936.

2. There is some variation on different days in the same individual working under the same concentrations. I have found that in some cases the inorganic sulfates in the urine are as low as 50 per cent one day and a recheck the following day at the same time and with the same concentration shows them to be 80 per cent. If this were a single case I would say that the discrepancy was due to technic, but a careful check of all reagents was made and controls were run to eliminate the possibility of error. I have made it a regular rule to have all urines below 70 per cent rechecked, and if this concentration persists I know that there is something wrong in the ventilation or that the individual is absorbing benzene from some other source.

3. Atmospheres containing from 100 to 115 parts per million in eight hours have but little effect on the inorganic sulfates, but over a period of time there is a slight change of from 8 to 10 points. I have not noticed any change in the blood when the concentration has ranged between 100 to 125 parts per million.

4. Alcohol and certain foods cause a change in the daily sulfates.

5. It has not been determined how long a person can work with inorganic sulfates below 50 per cent before a change in the blood occurs. I have several workers who have been working for one year and four months, with their inorganic sulfates fluctuating from 56 to 82 per cent, and their blood and all other examinations normal. These men are examined completely every month, and at the slightest change in the blood picture they are removed from contact with benzene. On several occasions I have found the inorganic sulfates between 8 and 10 per cent when the person had been cleaning clothes with benzene, but in two days, after there was no contact with benzene, the inorganic sulfates were up to 75 per cent.

However, may I impress the point of rechecking all cases in which the ratio is less than 70 per cent; if the percentage is 50 per cent or less two courses must be taken: The person must be removed from contact with benzene and the ventilation must be corrected until air samples show from 100 to 115 parts per million.

The accompanying table shows one of the numerous surveys made and the correlation between the concentration of benzene, inorganic sulfates and the blood picture.

This experiment shows the value of making frequent urinary sulfate determinations for the control of benzene absorption.

PREVENTIVE AND CORRECTIVE MEASURES

1. *Ventilation and Safety Devices.*—This is one of the most important factors. To keep the concentration of benzene in the atmosphere below a certain point one must recognize the fact that benzene fumes are heavier than air and that they are very diffusible. Ventilation from the floor by means of suction is preferable to overhead ventilation. Ventilation must be general, for benzene fumes form pockets. Benzene fumes liberated on one floor may produce a rather high concentration on a floor below if suction ventilation is not used.

2. *Healthy Persons in Operations Using Benzene.*—My experience has shown that undernourished, anemic persons or those afflicted with bronchitis, any pulmonary condition or cardiac or kidney infections should not be placed where they come in contact with benzene or gasoline fumes. Female help, as far as possible, should

not be placed where there is a very high concentration of any of these fumes, for no matter how healthy they are they begin to have menstrual disturbances after some absorption.

A certain group of persons can tolerate a large amount of benzene and show but little physical effect. Those who are shallow breathers seem to be less affected than the deep breathers. There appears to be some relation between the permeability of tissue diffusion in the lung tissues and the amount of absorption which causes physical symptoms to appear. Persons addicted to alcohol seem to tolerate benzene or gasoline fumes to a greater extent than others. I attempt to place only those in fine physical condition on operations in which benzene or any allied product may have to be used, and I believe that it has been worth while.

3. *Education Program.*—Proper instructions to the supervisors and the workers in all departments in which any volatile substances are used, such as benzene, gasoline, carbon tetrachloride or other such substances, are

Correlation Between Concentration of Benzene, Inorganic Sulfates and Blood Picture *

Sample Number	Position	Sampling Time, Min.	Volume of Sample, Cc.	Parts per Million	Comment
1	Between D 1 and 2 neutralizers	25	150	980	Filter overflow returning to D 1
2	D unit press.	19	150	490	Filtering
3	Platform front of C and D units	21	150	300	
4	Between C 1 and 2 neutralizers	22	150	1,471	Leak in benzene line on C 2
5	C unit press.	15	100	600	Filtering
6	Same as No. 1.	23	150	300	Doors closed
7	Same as No. 2.	21	150	300	Doors closed
8	Floor half way between presses	25	200	147	Both presses filtering
9	Between C and D reactors	19	150	196	
10	Between C and D spreaders	21	150	117	

* All tests were taken at a working level of from 5 feet 4 inches to 5 feet 6 inches, where the operator's nose is most apt to be when at work. These figures were taken from the rubber industry. C 1 and 2 and D 1 and 2 designate machines.

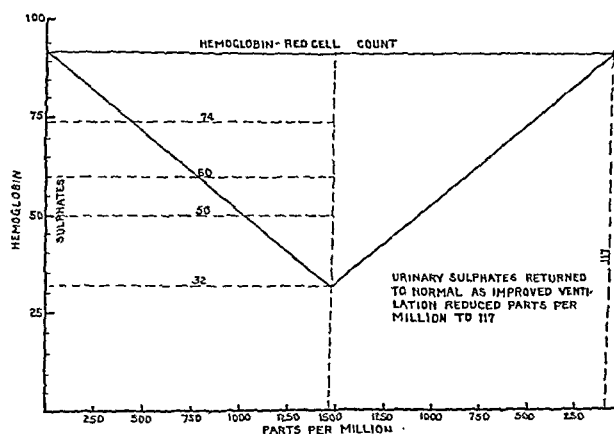
very important. They should be told of the properties of the substance they are using, what conditions might develop from excessive inhalation or exposure to it and how these conditions can be successfully prevented by taking precautions and obeying the instructions given.

4. *Frequent Examinations.*—All persons should be examined before being allowed to work in these departments. They should have examinations every thirty to ninety days, according to the concentrations of the vapor in the various departments. If examination of the blood, urine, blood pressure, vision, sensation and equilibration shows any indications of absorption, the person should be transferred to some other job. Workers are advised of general health principles and methods of elimination of absorbed benzene.

5. *Substitution Products in Place of Benzene.*—Many substitutions have been tried to replace benzene, such as its higher homologues toluene, naphthalene and xylene and other solvents of the unsaturated hydrocarbons. My experience has been that gasoline is less poisonous and will eventually replace benzene in nearly all operations until a better nonpoisonous solvent is found.

Batchelor⁵ has done some remarkable experimenting with benzene and some of its higher homologues by using intraperitoneal and subcutaneous injections and inhalations in groups of animals. His conclusions are that toluene, xylene and hi-flash naphtha are vastly superior from a toxic standpoint and are practically devoid of the industrial hazard involved in the use of benzene. This statement is true with regard to the relations of the toxicity, but I do not believe that toluene, xylene and hi-flash naphtha can be so lightly considered.

It is not occasional exposure to these compounds that causes the harm but the daily exposure over long periods of time. Various mixtures, under commercial names, have been tried for solvents in order to reduce the flash point, thereby reducing the fire hazard. These invariably contain carbon tetrachloride. Carbon tetrachloride in small quantities, when inhaled, causes extreme nausea and often severe vomiting and should be used only in closed systems of ventilation. I have found that gasoline works almost as well as benzene in most operations, and the number of cases of dizziness and nausea has been reduced to a minimum.



Hemoglobin and red cell count not affected; insufficient exposure; exposure controlled by urinary sulfate determinations.

Many things must be considered before the use of a substitute product in industry is advocated:

1. Is it injurious to the human being?
2. Is its operation more or less efficient?
3. Is its operation more or less expensive?
4. Does it require a large outlay of expense to install?
5. What is the competitor using and what is the quality of his product?

It requires very close cooperation between the medical department, the chemical department, the safety department and the production efficiency department to arrive at a proper conclusion.

METHODS OF CORRECTING CONDITIONS

The methods of correcting conditions when volatile substances are used resolve themselves into a very definite procedure:

1. Experimentation and research made on the substance used as to its detrimental effects on the human system. If such a substance causes detrimental effects, three main recommendations should be made;

A. Discontinuance of the substance, and if this is not possible, then

B. Substitution of an allied substance not so detrimental, and if this is impossible then

5. Batchelor, J. J.: *The Relative Toxicity of Benzol*, Am. J. Hyg. 7: 276 (May) 1927.

C. Use of the substance in a closed, airtight system, which prevents dissemination of the gases, or institution of suction ventilation, depending on the nature of the substances as to whether its gaseous form is heavier or lighter than air.

2. The rotating of the individuals who work with the substance to other jobs.

3. Use of gas marks. This has not proved very practical in industry.

4. Frequent examinations: Removal from the job of any one showing signs of poisoning, such as: (1) persistent urinary sulfates below 70 per cent; (2) slight purpura or hemorrhage from mucous membranes or other organs; (3) reduction in white cells of 1,500 below normal (a 7,000 count is assumed as normal); (4) reduction of red cells of from 10 to 15 per cent below normal; (5) reduction of hemoglobin below 80 per cent, and (6) slight variation in coagulation time.

TREATMENT

A person who, on examination, shows any effects of a solvent such as benzene or its homologues, gasoline or its derivatives or carbon tetrachloride, is immediately removed from contact with the substance. The treatment proper of benzene consists of: (1) elimination; (2) aeration, oxygen inhalations; (3) treatment of gastric disturbances; (4) treatment of secondary anemia; (5) supportive measures for the heart and protection of the kidneys; (6) stimulation of the blood-forming organs by use of iron compounds, reticulogen, liver and spleen substances, transfusions and roentgen therapy to the long bones; (7) nourishing food with an excess of animal fats; (8) increase of the calcium intake, and (9) intravenous saline and dextrose.

CONCLUSION

Experience has shown that benzene and its derivatives present a very definite and serious industrial health hazard. The primary effects of these substances are produced on the blood and blood-forming organs with secondary involvement of the nervous system and other organs. In high concentrations they cause acute poisoning, often with sudden death, and in low concentrations a slow but chronic poisoning. The hazard can be perfectly controlled by certain definite procedures:

1. Proper ventilation.
2. Substitution of less poisonous solvents.
3. Frequent examination, and the early removal of any one showing slight symptoms of poisoning, as detected by a low urinary sulfate determination.
4. Proper education of the supervisors and workers.
5. Close cooperation between the production and medical departments.
6. Establishment of physical standards for those who are going to work with benzene or any of its homologous compounds.

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ABSTRACT OF DISCUSSION

DR. A. G. CRANCH, New York: The warning is still timely not to confuse benzene with benzine. The two products are different technically and in toxicity. There are also various impurities in commercial benzene. With regard to early case finding, much emphasis is often placed on blood counts showing reduction in leukocytes and red cells. Dr. Davis has warned of the leukocytosis which sometimes precedes the leukopenia and may be misleading. Urinary tests furnish a practical guide, but Dr. Davis well emphasized the pitfalls: the

errors due to mixed solvents, the daily variations which may occur in the individual case and the failure at times to obtain a significant test even in the presence of dangerous exposure. In preventive work it is well to remember the heaviness of the fumes. This condition is present with many industrial solvents and calls generally for lateral or down draft for its removal. I would stress the value of education. I have had good results by particularly instructing workers not to inhale the fumes recklessly, and in case of an unusual or temporarily increased exposure they almost involuntarily withdraw and cease to breathe deeply. There are dangers in substituting other solvents for benzene, as sometimes the substitute may prove to be equally or more toxic. This is true also in some cases in which benzene has been diluted with other solvents. I would ask Dr. Davis what he can tell us as to recurrence of serious symptoms among patients who had apparently returned to normal after treatment for benzene poisoning. Such apparently cured persons with a normal blood picture after a slight intercurrent infection like influenza sometimes seem rapidly to grow worse. Is this usually the case? Something to bear in mind with regard to benzene poisoning is that in the patients' subsequent life great care should be exercised to avoid the exposures which might reactivate their symptoms.

DR. LOUIS SCHWARTZ, New York: As Dr. Davis stated, the use of benzene in industry is diminishing and its place is being taken by solvent naphtha or some other agent which is less toxic. Toxic symptoms usually occur from inhalation of these substances and not from contact with the skin. Dr. Davis has said that 95 per cent of the cases of benzene poisoning are due to inhalation. That is true because when these substances are inhaled they are inhaled in minute proportions and taken into the body; they do not irritate the mucous membranes or the skin. If the skin is exposed to them in concentrated form, it is defatted and blistered and its absorptive qualities are impaired. This is true of all the volatile solvents; those substances do not inflame the skin but penetrate it, and they are more likely to cause toxic reactions than those which inflame the skin. Most of these volatile solvents take the fat out of the skin. Persons who have greasy skins can withstand their action much better than those who have dry skins. This brings up the point of how to prevent dermatitis from these substances. When a person handles them he should rub olive oil or some other animal or vegetable fat into the skin to replace whatever fat has been taken out by the solvent. Another way of preventing dermatitis from these substances is to wear gloves; rubber gloves ordinarily do not withstand the action of these solvents and are easily soluble in them, so synthetic rubber should be used because that stands up much better. I should like to ask Dr. Davis what his experience has been in noting symptoms of dermatitis in cases of benzene poisoning. He will probably tell you that dermatitis is not common among those who suffer with benzene poisoning, and those who suffer from dermatitis are not so likely to have benzene poisoning.

DR. P. A. DAVIS, Akron, Ohio: In answer to Dr. Cranch's question in regard to the recurrence of symptoms with some concurrent infection, I do not believe that the patient has been discharged as completely cured before he has this condition. For instance, I had occasion recently during an epidemic of influenza to observe several men who, while they had a low urinary sulfate level, around 60 or 70 per cent, were taken off the job and subsequently contracted an influenza infection. They returned to normal slowly, probably because benzene absorption had produced some effect on the myelogenous tissues and on the spleen and prevented the normal return of the blood cells. I recall a case in which a man had had acute benzene poisoning and there developed definite leukopenia and erythropenia; his urinary sulfates returned to normal in three weeks and his blood to 95 per cent. The red and white cells returned to normal. He was not put back in contact with benzene but was placed in another position entirely free from any volatile substances, and influenza developed. After his influenza apparently cleared up he still seemed to have benzene

poisoning, and the only explanation I have for that is that the blood-forming organs had not returned to normal before he had a subsequent infection or some other involvement. It takes a long time for the blood-generating organs to return to normal antibody formation. They remain as a stationary factor for some time after the blood picture and the urinary sulfate picture have assumed a normal status. With regard to the dermatitis caused by benzene, acute benzene poisoning does not necessarily show up as a skin condition at all. The dermatitis from benzene is contact dermatitis and not systemic dermatitis. In only a few cases does systemic dermatitis result from benzene poisoning. With regard to protection of the workers, I have a hard time convincing the engineers that, since nobody has been killed or poisoned while manufacturing these materials, no one should be poisoned or killed while using them. If proper protection is given, whether against benzene, a halogenated compound or any other volatile substance with toxic effects, by masks or whatever safety devices are available, I do not think any trouble will be experienced. The organization with which I am connected has instituted the use of a wax ointment. Men who are going to work with benzene smear it all over their hands, arms and faces. This ointment is not soluble in benzene, so they have little absorption but sufficient skin protection. I think there must be external protection against all these substances if acute absorption is to be avoided.

THE CARDIOPATHOLOGY OF HEATSTROKE

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Under the term "heatstroke" are herein included four deaths from hyperpyrexia, one caused by insolation or "sunstroke," and three from artificially induced pyrexia by the so-called fever machine.

Historically this affliction is as old as Biblical times, being described in 2 Kings (Osler¹). The early Arabians felt that Sirius, the Dog Star, in some way was responsible for the symptomatology and called the disease "siriasis." During the British occupation of India and subsequently, heatstroke has received considerable attention, but the pathologic condition in the fatal cases has apparently been decidedly secondary to the clinical manifestations. Osler¹ dispenses with the morbid anatomy in these few words: "Rigor mortis occurs early and putrefactive changes may come on with great rapidity. The venous engorgement is extreme, particularly in the cerebrum. The left ventricle is contracted (Wood) and the right chamber dilated. The blood is usually fluid; the lungs are intensely congested. Parenchymatous changes occur in the liver and kidneys."

Webster² also dismisses death from heatstroke with this concluding sentence: "The autopsy findings will be those due to either syncope or asphyxia." From the condition at autopsy of the four cases to be presented it would appear that the cardiac lesions found in all the cases closely approximate those found in death from electricity or lightning as described by Kratter (quoted by Webster) and consisting of "subendocardial ecchymotic extravasations combined with bloody emphysema of the larger bronchi." Wood³ adds nothing to Osler's description of the morbid anatomy.

1. Osler, William: *The Principles and Practice of Medicine*, ed. 10, New York, D. Appleton & Co., 1927.

2. Webster, R. W.: *Legal Medicine and Toxicology*, Philadelphia, W. B. Saunders Company, 1930.

3. Delafield and Prudden's *Textbook of Pathology*, revised by Francis Carter Wood, New York, William Wood & Co.

REPORT OF CASES

CASE 1.—C. O., a white man aged 45, a laborer, had been out of work for several months. September 15 he reported for work with a logging crew, working as a sawyer. By a coincidence this day was one of the hottest days of the year, averaging about 92 F. in the woods where the crew was working. At noon the man came to the mess shack but did not feel very well, said he was "sick to his stomach" and drank only a cup of coffee. Returning to work after the lunch rest, he worked more slowly than his partner until midafternoon, when he suddenly dropped his saw, began to shout and tear his hair, and then ran off into the woods. Pursued by his fellow workers he was returned to the camp "raving mad and so hot he sizzled," according to the foreman. On admission at the hospital his temperature was 105 F. and he was unconscious. Two hours later (about four hours after the acute onset), and without regaining consciousness, he died with a temperature of 107 by axilla. At the autopsy, three hours after death, a purpuric spot deep in the right axilla, and a series of similar spots over the back and midportion of the left arm, were observed. The chest contained approximately 150 cc. of bloody fluid in each pleural cavity and there was marked pulmonary congestion with bloody froth in the bronchi. The heart showed a massive subendocardial hemorrhage on the septal and posterior walls of the left ventricle extending up under the base of the mitral valve. There were petechial spots in both kidneys.

CASE 2.—I. T., a white man aged 62, had "fever therapy" in a doctor's office. This was his second such treatment. It was started at 10 a. m., and at 1 p. m. the temperature was 106 F. and the heat was discontinued. At 2 o'clock he was removed from the machine and at 5 o'clock the temperature was still 106 and the patient was unconscious. At 8 o'clock he was admitted to the hospital in a deep coma and he died shortly after midnight without regaining consciousness, with a terminal temperature of 106 F. by axilla. The autopsy gave essentially negative results except for cerebral edema and congestion, and subendocardial hemorrhages throughout the septal and posterior walls of the left ventricle.

CASE 3.—F. J., a white man aged 23, always previously well, had "fever therapy" for a gonorrheal urethritis. He had been removed from the cabinet and his temperature was down to 101 F. by mouth when it suddenly began to rise and in spite of constant ice packs the heat rose to 110 degrees by axilla and he died approximately three hours after the temperature began to rise. Autopsy showed petechial hemorrhages on the right side of the chest and small extravasations of blood throughout the pectoral muscles. There was a massive subendocardial hemorrhage in the left ventricle involving the septum and the posterior wall, extending through the thickness to the septum. There were also petechial hemorrhages in the brain stem and kidney.

CASE 4.—M. L., a white man aged 26, was given "fever therapy" for the third time in a doctor's office. After removal from the machine his temperature had dropped to 101 F. by mouth when he had a convulsion and his temperature began to rise. He was sent to the hospital and packed in ice but his temperature continued to rise and at death, four hours after the convulsion, the axillary heat was 108.6 F. Autopsy revealed congestion of the brain with extravasations of blood about the superior surface of the cerebellum and a subendocardial hemorrhage in the left ventricle, rather generalized, but most marked in the septum in the region of the bundle of His.

COMMENT

In four deaths from hyperpyrexia, one "natural" and three "fever therapy" cases, the same type of heart lesion was present and yet all four persons before the fatal illness were supposedly in "good health." The predominant feature of the clinical picture is the tremendous rise in body temperature, accompanied by unconsciousness, and both probably caused by cerebral edema and later by actual petechial hemorrhages in the brain.

The most striking, and probably the actually fatal, mechanism is a rather extensive hemorrhage under the endocardium of the left ventricle, especially on the septal wall in the region of the bundle of His. In none of these cases were seen the gastrointestinal hemorrhages reported by Chunn and Kirkpatrick.⁴

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DERMATITIS AMONG PLATE PRINTERS

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In a large printing establishment, a considerable percentage of plate printers had suffered for many years from recurrent cutaneous lesions of the hands and arms. So frequent were these lesions that the employees and the management requested an investigation not only because of the protests of the workers but also because of the financial loss due to compensation and time lost from work.

The establishment employs 1,058 workers, but most of the dermatitis occurred among the group of 318 plate printers and their forty-seven skilled helpers. This group of men lost thirteen man years of working time during the period of 1900-1936 at an estimated loss of \$50,000 in lost time, not counting compensation, cost of medical treatment and the sufferings of the workers.

Among the other 693 workers no records could be found of any lost time from occupational dermatitis occurring during this period.

OCCUPATIONAL PROCESS

The engraved plates are covered with ink by press rollers and the plate printer wipes the excess ink from the plates by passing the bare hands rapidly over the plate. The ink that accumulates on the hands is wiped off on an apron. The apron is usually heavily crusted with dried ink from continued use, showing that it is but infrequently changed. In the interval between wiping off the plates, the plate printer cleans the ink from used plates with a piece of cloth saturated with gasoline which he holds in his bare hands. In these operations the hazards to the skin are not only from simple contact with the ink and gasoline but also from having the ink rubbed into the skin.

To clean the hands, which is done twice a day, the plate printers use a common sink containing a light nonirritant mineral oil in which the ink is soluble. The hands are wiped off with cheesecloth which is kept in the oil. Following this, soap and water are used to remove the oil from the hands. Many of the workers, in addition to the soap and water, use a stiff brush for scrubbing and some use potassium carbonate with the brush, while others use white sand and still others use all these cleaning agents. The abrasive action of these mechanical cleaners and the keratin solvent action of the potassium carbonate were no small factors in the etiology of the dermatitis. As proof of this, twenty-four rotary press printers who have some ink exposure but whose work does not entail wiping the ink off the plates and who did not use the brushes for cleaning the

4. Chunn, G. D., and Kirkpatrick, C. L.: Fatal Result of Artificial Fever Therapy, *Mil. Surgeon* 81:281 (Oct.) 1937.
Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

hands had no dermatitis at any time. In fact, when plate printers complained of stubborn cases of dermatitis they were often transferred to the rotary press printing job, where the dermatitis disappeared. On the other hand, among the forty-seven skilled helpers whose job it was to clean the ink buckets and fountains with gasoline there occurred three cases of dermatitis. These workers were exposed to more gasoline than were the plate printers but were less exposed to the inks, and they also used the same cleaning methods as were used by the plate printers.

Actual examination was made of 389 workers. The occupational history was taken to determine the workers' entire industrial experience, which disclosed that the majority of the plate printers, rotary press printers and skilled helpers had spent their entire working time at these occupations at their present place of employment and that all the employees who had dermatitis of the hands incurred this condition while working at this establishment. The shortest length of time after

of the physical examination. Four types of cutaneous lesions were found: 1. Chronic inflammation of the skin characterized by erythema and papules which developed into vesicles varying in size from a millet seed to a marble. The vesicles were easily ruptured, leaving denuded areas and forming crusts. Scaliness and fissures often followed this crusting and remained for a considerable time. Occasionally infection of a ruptured vesicle resulted in the formation of pustules and ulcers. New crops of vesicles appeared from time to time and some of the patients stated that they had had this condition of the hands for more than fifteen years. The dorsum and the interdigital spaces, the palms and the wrists of both hands were usually affected. However, in a few cases the lesions were restricted to the right hand. Sixteen of the twenty-one plate printers had dermatitis of this type. 2. The three skilled helpers, whose work it was to clean the ink fountains and buckets, and two plate printers had chronic dermatitis of the hands and wrists characterized by induration,

TABLE 1.—*Dermatophytosis of the Feet*

	Plate Printers				Rotary Press Printers				Skilled Helpers				Patch Tests					
	Dermatitis of Hands at Present		No Dermatitis of the Hands		Dermatitis of Hands at Present		No Dermatitis of the Hands		Dermatitis of Hands at Present		No Dermatitis of the Hands		Total		Positive		Negative	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total number examined.....	21	....	264	....	0	..	23	....	3	....	43	....	354	....	13	....	82	....
Microscopic examination positive for pathogenic fungi of feet.....	7	33.3	91	34.5	0	0	8	34.8	1	33.3	9	20.9	116	32.8	5	38.5	28	34.1
Culture positive for pathogenic fungi of feet.....	6	28.6	71	26.9	0	0	5	21.7	1	33.3	10	23.3	93	26.3	5	38.5	21	25.6
Clinical evidence of dermatophytosis of feet.....	7	33.3	84	31.8	0	0	7	30.4	0	0	13	30.2	111	31.3	6	46.2	25	34.2
One or both microscopic or cultural examinations positive for pathogenic fungi of feet.....	8	38.1	100	37.9	0	0	8	34.8	1	33.3	12	27.9	129	36.4	5	38.5	29	35.4
Clinical evidence of dermatophytosis of feet, and either microscopic or cultural examinations or both positive for pathogenic fungi of feet..	4	19.0	48	18.2	0	0	4	17.4	0	0	4	9.3	60	16.9	4	30.8	16	19.5
Clinical evidence of dermatophytosis of feet, but negative by microscopic and cultural examination...	3	14.3	36	13.6	0	0	3	13.1	0	0	9	20.9	51	14.4	2	15.4	12	14.6
Either clinical evidence of dermatophytosis of feet or microscopic examination or cultural examination positive for pathogenic fungi of feet.....	11	52.4	176	51.5	0	0	11	47.8	1	33.3	21	48.8	180	50.8	7	53.8	41	50.0

Of the 318 plate printers, twenty-five had only an examination of the hands, and on eight no specimens for mycologic study were made.

employment that it took dermatitis to develop was eleven months and the longest about forty years. About one half the number of workers who had dermatitis had worked for ten years or more before they contracted it.

The past and present medical histories were taken in an attempt to tie up any allergic personal or family history with the susceptibility to the dermatitis, as well as in an effort to determine its origin and duration.

A history of familial allergy was about the same in all the groups examined, but it was found that a personal history of allergy was twice as frequent among those who had dermatitis as among those who had not. The season of the year played no role in the occurrence of the dermatitis. Thirty-eight per cent of the workers who were found to have dermatitis and 57 per cent of the workers who stated that they had had dermatitis lost no time from work because of their condition. The majority of the remaining affected employees lost from one week to two months' time from work as a result of their dermatitis.

The men were then stripped and examined for cutaneous lesions. Twenty-one plate printers and three skilled helpers had dermatitis of the hands at the time

roughness, dryness and wrinkling, accompanied by firmly adherent thin scales and no vesiculation. This type of lesion is characteristic of chronic dermatitis caused by long exposure of the skin to fat solvents.

3. One plate printer had a pustular perifolliculitis of the dorsum of the hands and plugging of the pores of the skin on the hands and forearms with numerous pit-like scars from healed areas of previous folliculitis. The dorsum of the hands and forearms of about 20 per cent of the plate printers showed enlarged pores plugged with dried ink. 4. Three plate printers had an eruption of the palms characterized by deep-seated vesicles, resembling dermatophytids. In addition, these men gave negative patch tests and had demonstrable fungous infections on other parts of the body.

Thirty-seven additional plate printers gave a history of having had dermatitis of the hands, which they considered due to their occupation. Three of these are now employed as rotary press printers and have had no dermatitis since that time.

In an effort to find what part fungous infections played in the etiology of the dermatitis occurring in this establishment, microscopic and culture examinations of material from the hands and feet of 354 of these

men were made. In this study a definite diagnosis of dermatophytosis was made only when pathogenic fungi could be demonstrated either by the microscope or by culture.

Pathogenic fungi were present in 129 cases (36.4 per cent). All the fungi were isolated from the feet—none from the hands. The lesions seen on the hands of the men did not resemble dermatophytoses. Moreover, there was no difference between the mycologic observations on the plate printers who had dermatitis on the hands and the mycologic observations on the other men examined who did not have dermatitis. Neither was there any difference in the frequency of occurrence of clinical evidence of dermatophytosis between these groups.

Patch tests were performed on 121 individuals, of whom eighteen were plate printers who had dermatitis of the hands at the time of examination. Thirty-three were plate printers who gave a history of dermatitis of the hands. As controls I used fifty plate printers who had been employed for ten years or longer and who had never had dermatitis of the hands, and twenty employees of the Industrial Hygiene Division of the National Institute of Health who never had known contact with any of the printing inks used. No positive reactions were obtained among the seventy controls given patch tests. Nine of the eighteen plate printers who had dermatitis at the time of examination gave positive reactions to the inks. Four of the thirty-three plate printers who gave a history of dermatitis of the hands gave positive reactions to the inks. Some of those who gave positive reactions reacted to more than one of the inks. Reactions were obtained only from orange, red, brown and yellow inks. The thirteen inks used in the patch tests were all of secret formulas and of complex composition, containing at least thirty coloring components in addition to various fillers, varnishes, oils and driers. I was informed that there are more than 1,000 different ingredients used in making these inks. Patch tests with the individual components of the inks could not be performed because their compositions are secret and therefore were not revealed to me.

Most of the dermatitis found in this establishment was undoubtedly of occupational origin, as is shown by the history and clinical appearance of the lesions and by the results of the patch tests. Dermatophytoses played but a small, if any, role in the etiology of these cases.

The actual causative agents were proved to be the inks and the cleaning materials used for the plates and for the skin.

The action of these irritants was augmented by mechanical trauma of the occupational process.

Hypersensitivity, acquired after exposure for a year or longer, was a factor in about 25 per cent of the cases, as was shown by the patch tests.

RECOMMENDATIONS

1. A complete preemployment examination should be made of plate printers by a physician who is aware of the hazards to the skin associated with these occupations.

2. Periodic medical examinations of plate printers should be made, particular attention being paid to the evidence of cutaneous diseases. Dermatitis of any employee should be carefully investigated and proper remedial measures instituted.

3. Workers handling cleaning fluids should, whenever possible, be required to wear rubber gloves with the sleeves buttoned down over the gloves in order to prevent the irritant chemicals from getting inside the gloves. Such rubber gloves should be made of synthetic rubber which is not easily affected by the volatile solvents.

4. Clean towels and clean aprons should be furnished to the workers daily.

5. The use of a common oil trough should be discontinued and some method should be instituted whereby each worker uses oil and cheesecloth not used by any one else.

6. The use of abrasive cleaning agents and strong alkalis should be prohibited. Only a good grade of liquid soap should be used.

7. Shower baths and wash rooms should be kept clean and scrubbed daily with soap and hot water.

8. Individual paper sandals should be furnished workers using the shower baths.

9. Separate lockers for work clothes and street clothes should be furnished plate printers to prevent soiling the street clothes with the inks and other substances capable of producing dermatitis.

National Institute of Health.

ABSTRACT OF DISCUSSION

DR. LOUIS SCHWARTZ, New York: Sometimes the reluctance of the managers of a company to reveal secret formulas may be overcome by asking them to put together groups of chemicals, not giving their names, for patch testing. For instance, all the dyes that went into the composition of the offending inks could have been mixed together without their names being divulged and the susceptible workers patch tested with the mixture to find out whether the dyes were the irritants. If a positive patch test resulted from this mixture of dyes, then the management could have been asked to divide the dyes into six groups of five dyes each, still not divulging the names of the dyes but only giving them numbers. Patch tests could then have been performed with the six groups of dyes and the group which gave the positive patch test would have been the one that contained the offending dye. The individual dyes in this group could then have been used for patch testing and the offending dye could have been identified by number and surely there could have been no objection from the management to give the name of the offending dye, provided the names of the ones that did not cause dermatitis were not mentioned. This would not have revealed a secret formula. The same procedure could have been followed with the various varnishes, oils, fillers and driers which went into the composition of the inks. It is inferred that removal to other jobs resulted in a cure of the dermatitis; but the paper also states that thirty-seven additional plate printers with a history of dermatitis no longer had it although they were still working at the job. This shows that these men had lost their hypersensitivity. I wish to emphasize that it is not advisable to remove employees with mild occupational dermatitis from their jobs before they are given a chance to get "hardened," as they call it. This losing of their hypersensitivity or developing an immunity actually happens in many cases if the man with dermatitis continues to work and gets well while on the job. In other words, continued exposure to a chemical sensitizes some workers, but most of those who thus become sensitized will become immune if they are allowed to continue to work. Of course, while working they should be given proper protective clothing as well as treatment for their condition. Only those should be taken off the job and transferred to other occupations who show that they cannot acquire this immunity. I would advocate that at least a month's trial at a job be allowed for those with mild involvement so as to give them a chance to become hardened.

A STUDY OF 2,400 ELECTROCARDIOGRAMS OF APPARENTLY HEALTHY MALES

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The chief hope of influencing favorably the mortality and morbidity of coronary heart disease rests with the earliest possible detection of its presence in an individual, as well as the elimination of predisposing factors. The only means available at present by which the presence of coronary disease can be detected before symptoms are present is by the electrocardiogram. Although one is not justified in attempting to diagnose heart disease from an electrocardiographic tracing alone, changes in the coronary circulation frequently occur which can be detected by electrocardiogram long before symptoms or signs become apparent. The extent to which disease must progress before symptoms become evident varies with individuals and is by no means constant. An exact relationship between the objective appearances in the electrocardiogram and the symptoms and progression of the disease has not been established.

A serial study of electrocardiograms in conjunction with the physical examination and an analysis of habits, occupation and diversions, beginning at a time when the coronary circulation is normal as judged by electrocardiographic appearances as well as subjective symptoms, and continuing at regular intervals through life, would be enlightening. By such means it might be possible to correlate habits, exercise, work and various physical factors with the onset and subsequent development of coronary heart disease. Such an investigation is now in progress.

This report is based on the study of 2,400 electrocardiograms taken as part of the periodic health examination of apparently healthy men. These were all policyholders with more than \$25,000 of life insurance in force, who were allowed the privilege of this examination each year. They represent men from every state in the country, in both urban and rural communities. The average age of the entire group was 47.8 years.

TABLE 1.—Symptoms Referred to the Heart in 2,400 Apparently Normal Males

Complaint	Group 1 (811, 33.8%) No Abnor- malities	Group 2 (1,339, 55.8%) Borderline Impair- ments	Group 3 (250, 10.4%) Definite Impair- ments
Pain around heart.....	1.7	4.0	5.2
Palpitation.....	0.9	1.0	2.8
Shortness of breath.....	1.4	1.7	3.2
Heartburn and pain in abdomen.....	2.8	2.7	1.6
Fear of heart disease.....	0.4	1.0	1.2
No symptoms.....	93.1	90.3	87.2

In this study the attempt to correlate habits and the results of physical examination with electrocardiographic changes has been made. Only the three conventional leads have been considered in the electrocardiogram.

The group of 2,400 has been divided into three classifications: first, those with normal electrocardiograms; second, those with borderline changes; and, third, those with definite impairments. We have con-

sidered borderline such electrocardiographic changes as low or iso-electric T₁ and T₂, left or right axis deviation, inverted or diphasic T₃, premature contractions, and depression of the RT segments of more than 1 mm. We have considered as definite impairments such changes as PR interval of more than 0.21 second, QRS interval more than 0.11 second, inverted or diphasic T₁, inverted or diphasic T₂, relatively deep Q₃, auricular fibrillation, or any combination of these. In group 1, that is, those which are normal, were found 33.8 per cent; in group 2, the borderline, 55.8 per cent; and in group 3, those with definite impairments, 10.4 per cent.

The various complaints of the individual at the time of examination were carefully noted and are listed in table 1. Among these were listed precordial distress of any kind, palpitation, dyspnea of even the slightest degree and abdominal pain. Also included among those

TABLE 2.—Percentage Incidence of Abnormalities and Habits of 2,400 Males, Grouped According to the Seriousness of Electrocardiographic Changes

Complaint	Group 1 (811, 33.8%) No Abnor- malities	Group 2 (1,339, 55.8%) Borderline Impair- ments	Group 3 (250, 10.4%) Definite Impair- ments
Weight			
Overweight 10% or more.....	24.5	45.7	46.4
Underweight 10% or more.....	6.9	2.0	1.6
Cardiac enlargement.....	1.0	3.0	9.2
Heart murmurs			
Systolic.....	4.8	6.0	10.4
Diastolic.....	0.1	0.1	1.6
Blood pressure			
Systolic 150 mm. or more.....	3.4	9.9	19.6
Diastolic 100 mm. or more.....	2.1	6.3	14.8
Occupation—executive.....	67.7	70.7	72.0
Habits			
Users of tea.....	26.0	31.6	36.8
Users of coffee.....	82.5	79.5	80.8
Users of alcohol.....	76.0	71.7	71.5
Recreation			
Sedentary hobbies.....	5.4	5.6	4.8
Moderate exercise.....	55.5	53.2	52.0
Strenuous exercise.....	16.0	11.6	8.8
History of heart disease in family.....	16.5	16.6	17.2
Average age.....	45.8	48.5	50.8

with complaints was any person who mentioned that he was at all heart conscious or had any fear of heart disease. In group 1, 93.1 per cent had no complaints. In group 2, 90.3 per cent had no complaints. In group 3, 87.2 per cent had no complaints. It is to be remembered, however, that these people came for a periodic health examination and not necessarily because they were ill. It is interesting to note that only 12.8 per cent of those who had serious impairments gave any symptoms that could be at all referable to the heart.

In table 2 is an attempted correlation of the various observations from the physical examination with electrocardiographic changes. The most significant factor noted was the prevalence of overweight in group 3. In group 1, 24.5 per cent were more than 10 per cent overweight, while in group 3, 46.4 per cent were overweight. In group 1, 6.9 per cent were underweight and, in group 3, 1.6 per cent were underweight. Thus, overweight is found approximately twice as frequently in group 3 as in group 1.

Enlargement of the heart as determined by palpation and percussion was found present in only 1 per cent of group 1 and 9.2 per cent of group 3. This is very striking.

Systolic murmurs were heard in 4.8 per cent of group 1 and 10.4 per cent of group 3, a very substantial increase.

From the records of the Life Extension Examiners.

The study of blood pressure seemed particularly significant. In group 1 there were 3.4 per cent who had a systolic pressure of more than 150 mm. In group 3 there were 19.6 per cent who had a systolic pressure of more than 150 mm. In group 1 there were 2.1 per cent who had a diastolic pressure of more than 100 mm. In group 3 there were 14.8 per cent who had a diastolic pressure greater than 100 mm. This indicates that hypertension was more than six times as prevalent in group 3 as in the normal group.

TABLE 3.—*Electrocardiographic Impairments in Various Blood Pressure Groups*

Diastolic Blood Pressure	(2,400) Number in Group	Group 1 (811, 33.8%) No Abnormalities	Group 2 (1,339, 55.8%) Borderline Impairments	Group 3 (250, 10.4%) Definite Impairments
Less than 70.....	305	46.6	41.6	11.8
From 70 to 79.....	818	40.0	52.4	7.6
From 80 to 89.....	820	22.0	38.3	9.8
From 90 to 99.....	309	19.1	69.9	11.0
100 or more.....	138	12.3	60.9	26.8

In order to throw further light on the relationship of blood pressure to electrocardiographic changes, the cases included in groups 1 and 3 were divided into those whose diastolic pressures fell between 70 and 80, 80 and 90, 90 and 100 and over 100 mm. This is shown in table 3. A very significant increase was noted in those who fell in group 3 as the diastolic pressures increased. Of those whose diastolic pressures were between 70 and 80 mm., 40 per cent were in group 1 and 7.6 per cent were in group 3; diastolic pressures 80 to 90 mm., 32 per cent were in group 1 and 9.8 per cent in group 3; diastolic pressures 90 to 100 mm., 19.1 per cent were in group 1 and 11 per cent in group 3; those with 100 mm. or more, 12.3 per cent were in group 1 and 26.8 per cent

the laboring group. Of the total group 69.9 per cent were classed as executive. In group 1, 67.7 per cent were executive. In group 3, 72 per cent were executive. In studying habits it was found that 26 per cent of group 1 were tea drinkers and 36.8 per cent of group 3 used tea; 82.5 per cent of group 1 were coffee drinkers and 80.8 per cent of group 3 were coffee drinkers; 76



Fig. 2.—A man aged 48, a manufacturer: No subjective symptoms; physical examination negative except for systolic hypertension (184/86). The electrocardiogram shows regular sinus rhythm, right axis deviation, notching and spreading of QRS. A definite tendency to low voltage of QRS also is shown.

per cent of group 1 used alcohol and 71.5 per cent of group 3 drank alcoholic beverages.

In studying recreation and exercise it was found that 5.4 per cent of group 1 were admittedly sedentary, 55.5 per cent did moderate exercising and 16 per cent did strenuous exercising. In group 3, 4.8 per cent were sedentary, 52 per cent moderate and 8.8 per cent strenuous. Again there were no significant differences.

TABLE 4.—*Percentage Incidence of Definite Electrocardiogram Impairments Among Smokers and Nonsmokers (812 Males)*

Condition	Nonsmokers (339)	Smokers (473)
Inverted or diphasic T ₁ and T ₂	0.3	0.8
Auricular fibrillation.....	0.3	...
PR interval 0.21 second or more.....	1.2	1.1
QRS duration 0.11 second or more.....	0.6	2.5
Low or iso-electric T ₁ and T ₂	1.5	2.1
Inverted or diphasic T ₁	1.2	1.3
Inverted or diphasic T ₂.....	...	0.8
Relatively deep Q _s	2.1	2.7
Low voltage QRS (less than 5 mm.).....	0.9	1.7
Total with definite impairments.....	7.4	11.6

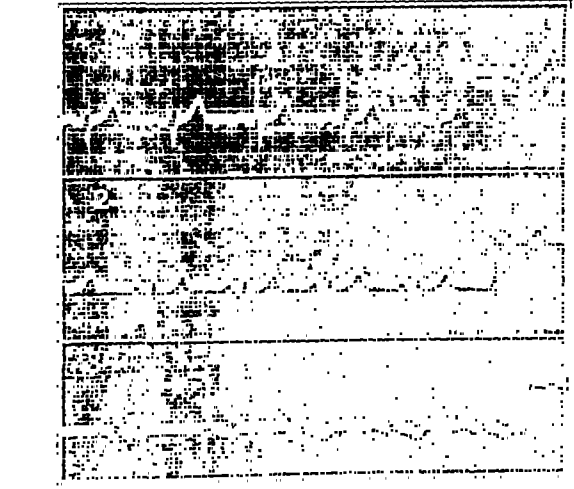


Fig. 1.—A man aged 48, a salesman: No subjective symptoms; negative physical examination. The electrocardiogram shows regular sinus rhythm and inversion of the T wave in the third lead. Q_s is relatively deep.

were in group 3. Thus there is a steady increase from 7.6 per cent in group 3 for those with diastolic pressures between 70 and 80 mm. to 26.8 per cent for those having a diastolic pressure of more than 100 mm.

Occupation has always been considered a very important factor in the development of coronary heart disease. Unfortunately, this series is somewhat selective in that each person involved had more than \$25,000 of life insurance and consequently few, if any, were of

The effect of smoking on either the development or the course of coronary heart disease has been much discussed for many years. In order to throw some more light on this problem two groups were taken from the series: those who had never used tobacco and those who admitted to smoking continuously for more than ten years. The results are presented in table 4. There were 339 nonsmokers and 473 who had smoked for more than ten years. Of the nonsmokers 7.4 per cent were found in group 3. Of those who had smoked for more than ten years there were found 11.6 per cent in group 3. Thus there is approximately a 50 per cent increase in the incidence of definitely abnormal electrocardiographic changes in the smoker as compared with the nonsmoker. This becomes more striking since the nonsmokers were an older group whose average age

was 48.5 as compared with 47 years for the smokers, and the incidence of overweight was slightly higher in the nonsmoking group. The most striking abnormality noted in studying these two groups was an increased QRS duration. We found this to be increased more than four times as often in the smokers as in the nonsmokers. This comparison of smokers and nonsmokers would seem to indicate that smoking does play some part in the subsequent development of abnormal electrocardiographic changes.

With regard to the history of heart disease in either father or mother, 16.5 per cent of group 1 gave a positive history and 17.2 per cent of group 3 gave a similar history. From this study a history of heart disease in either father or mother had little influence on the incidence of electrocardiographic observations.

SUMMARY

1. In conjunction with physical examinations, complaints and habits, 2,400 electrocardiograms were studied. Of these 33.8 per cent were normal, 55.8 per cent were borderline and 10.4 per cent were definitely abnormal.

2. In the abnormal group 87.2 per cent were entirely symptom free.

3. Overweight was found to be twice as frequent in the abnormal group as in the normal group.

4. Enlargement of the heart was found to be nine times as frequent in the abnormal group.

5. Systolic murmurs were found twice as frequently in the abnormal group.

6. Systolic hypertension was found six times as frequently in the abnormal group.

7. Diastolic hypertension was found seven times as frequently in the abnormal group.

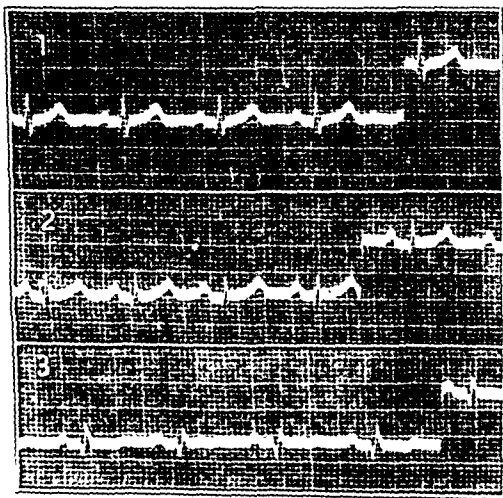


Fig. 3.—A man aged 46, an executive: No subjective symptoms; negative physical examination. The electrocardiogram shows regular sinus rhythm and low voltage of QRS. Q_s is prominent and T_a slightly inverted.

8. There was no significant difference between the two groups so far as habits of tea drinking, coffee drinking or alcohol consumption was concerned.

9. There was a 50 per cent increase in abnormal electrocardiographic observations among the group of smokers as compared with the nonsmokers.

10. With regard to the parental history of heart disease there was no significant difference between the two groups.

11 East Forty-Fourth Street.

COMPENSATION FOR INDUSTRIAL INJURIES AND OCCUPATIONAL DISEASES

SOME LEGAL AND MEDICOLEGAL ASPECTS

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The legal and medicolegal aspects of laws, state and federal, providing compensation for industrial injuries and occupational diseases are of great importance to physicians because of the broad scope and rapid expansion of industrial medicine as a phase of medical practice. Obviously, not all of the innumerable legal and medicolegal aspects of these laws can be presented here. A few of particular interest to the medical profession will be discussed.

COMPENSABILITY OF INDUSTRIAL INJURIES

The first comprehensive national scheme for providing compensation to injured workmen was established in Germany in 1884. It was not until 1902 that a workmen's compensation law was enacted in this country. In that year Maryland enacted such a law, which applied only to certain occupations, but it was later declared unconstitutional. In 1908 a federal compensation law, applicable only to the relatively few employees of the United States government engaged in hazardous occupations, was enacted and became effective August 1 of that year. Since that time all of the forty-eight states except Mississippi and Arkansas have enacted and placed in operation laws providing compensation to workmen for industrial injuries. In Arkansas a compensation law has been enacted, but its operation is suspended pending the outcome of a referendum which will be held in November 1940. In addition to state laws there are also federal compensation laws which apply to designated groups, such as civil employees of the United States government, longshoremen and harbor workers, workmen in the District of Columbia, and others. The federal government has also enacted workmen's compensation laws for Alaska, Hawaii and Puerto Rico.

Workmen's compensation laws may be compulsory or elective as to all employments covered or they may be compulsory as to some occupations and elective as to others. Compensation is compulsory for all or some private employments covered by the workmen's compensation acts in eighteen states and the District of Columbia and compulsory for all or some public employments covered in thirty-one states and the District of Columbia.¹ Compensation is elective as to all private employments affected in twenty-nine states and elective as to all public employments covered in fourteen states.² Where the right of election exists, it is commonly provided that if no election is made the three common law defenses are no longer available to the employer, namely assumption of risk, contributory negligence and the fellow-servant doctrine.

Workmen's compensation acts are commonly administered by agencies variously designated as workmen's compensation boards, commissions, bureaus, departments or commissioners. In Alaska and in six states, Alabama, Louisiana, New Hampshire, New Mexico,

From the Bureau of Legal Medicine and Legislation, American Medical Association.

1. Digest of Workmen's Compensation Laws of the United States and Territories, ed. 16, Association of Casualty and Surety Executives, 60 John Street, New York, 1939, p. 9.

2. Digest of Workmen's Compensation Laws, p. 10.

Tennessee and Wyoming, the laws are administered by courts, but even in these jurisdictions the operations of the laws are to some extent supervised or administered by designated administrative officials. In Connecticut there is a single commissioner in and for each of five autonomous districts. The workmen's compensation act of New York in some respects is administered by a single commissioner but in other respects it is carried out by an industrial board. Presumably hearings before the various administrative agencies or boards

only to certain stated hazardous or extrahazardous employments. Agricultural employments and domestic service are commonly exempted. Often it is provided that exempted employments may be brought under the act by election. In at least five states, Arkansas, California, Georgia, Idaho and New York, charitable organizations also are exempted. A waiting period after injury, varying from three days to two weeks, during which compensation is not to be paid, is usually provided.

TABLE 1.—Compensability of Occupational Diseases

State or Federal Law	Covered by Special Occupational Disease Acts 1, 2	Application of Law		Specific Coverage: Occupational Diseases Specifically Described or Scheduled	Blanket Coverage		Silicosis	
		Compulsory	Elective		Occupational Diseases Defined in General Terms	Occupational Diseases Essentially Undefined	Specifically Covered 3	Covered Under General Language 4
Arkansas 1	..	+	..	+	+	..
California	..	+	+5	..	+5
Connecticut	+	+
Delaware	+	+	+
District of Columbia	..	+	+6	..	+6
Idaho	+	+	+	..
Illinois	+	..	+	..	+	..	+	..
Indiana	+	..	+	..	+	..	+	..
Kentucky	+	+7	..	..	+	..
Maryland	..	+	..	+	+	..
Massachusetts	+	+5	+	..
Michigan	+	+	+8	..
Minnesota	..	+	..	+
Missouri	+	+9	..	+
Nebraska	+	+10	..	..	..	+10
New Jersey	+	+	+11
New York	..	+	..	+12	..	+12	+	..
North Carolina	+	+	+	..
North Dakota	..	+	+13	..	+13
Ohio	..	+	..	+14	+14	..	+	..
Pennsylvania	+	..	+	+	+	..
Rhode Island	+	+	+
Washington	..	+	..	+	+	..
West Virginia	+	+7	..	..	+	..
Wisconsin	..	+	+15	+	..
Longshoremen's and harbor workers' compensation act	..	+	+6	..	+6
Compensation act for civil employees of United States	..	+	+16	..	+16

Table is based on data in table entitled "Occupational Diseases Covered," Digest of Workmen's Compensation Laws of the United States and Territories, ed. 16, Association of Casualty and Surety Executives, 60 John Street, New York, 1939, page 14; Chart V, "Workmen's Compensation: Occupational Disease," as of Jan. 1, 1938, Division of Labor Statistics, U. S. Department of Labor; and data in files of Bureau of Legal Medicine and Legislation, American Medical Association.

1. Operation of law, enacted by state legislature providing compensation for industrial injuries and occupational diseases, is suspended pending outcome of referendum.
 2. In these four states, occupational diseases are compensable under occupational disease acts separate from workmen's compensation acts. Other than in these four states, the data presented in this table relate to workmen's compensation acts or amendments to such acts.
 3. Many of the laws which are designated as specifically providing compensation for silicosis also provide compensation for other occupational dust diseases, such as asbestos.
 4. Laws which provide compensation for silicosis but do not specifically mention silicosis may also be considered as providing compensation for silicosis and other occupational diseases.
 5. Law covers "injuries," inclusive of occupational diseases.
 6. Law covers "occupational disease or infection" undefined, arising naturally out of employment or resulting from accidental injury.
 7. Only occupational disease covered is silicosis. The Kentucky law covers only silicosis in employees engaged in glass manufacturing, quarries and sand mines or in manufacturing, treating or handling sand.
 8. Law covers silicosis in mining only.
 9. Law covers occupational diseases undefined, subject to joint election of employer and employee.
 10. Only occupational diseases covered are those in smelting, metal refining and battery manufacturing industries.
 11. Law can be considered as covering only silicosis if it occurs in certain industries. See footnote 10.
 12. Law contains a schedule but with an additional paragraph covering "any and all occupational diseases" undefined. The New York Court of Appeals in *Goldberg v. 954 Marey Corporation* (N. Y.), 12 N. E. (2d) 311 defined what is meant by "any and all occupational diseases."
 13. Law covers any disease "approximately" caused by employment.
 14. Law contains a schedule but with an additional paragraph covering "all other occupational diseases" in general terms.
 15. Law covers "harm" caused by accident or disease.
 16. Law covers disease proximately caused by or resulting from nature of employment.
- In addition, occupational diseases specifically described or scheduled are compensable in Puerto Rico and occupational diseases undefined are compensable in Hawaii.

were designed to be simple and informal, but actually in many jurisdictions today there is little difference between a controversy before such an agency and litigation before a court of law. The determinations of these administrative agencies are not final but may be appealed to the courts. However, the findings of these boards as to facts, if such are sufficient in law, are final.

The scope of laws providing compensation for industrial injuries differs so widely that it is well nigh hopeless to attempt classification. Some of these laws apply to all employments in which more than a designated number of workers, varying from two to sixteen, are employed. Other acts apply primarily or unqualifiedly

What conditions are compensable, that is, what constitutes a compensable industrial injury or accidental injury, will depend on the language of the workmen's compensation law in each particular jurisdiction. The majority of these laws by their terms require that the injury be accidental, that is, unexpected or unforeseen. There is a tendency, however, by amendment of the acts or by court interpretation not to require that the injury be accidental to be compensable. In most of the states the act covers only injuries "arising out of and in the course of" employment; in a few states, North Dakota, Pennsylvania, Texas and Washington, the law covers injuries incurred "in the course of" employment, and in

Utah the law covers injuries "arising out of or in the course of" employment. The acts of California, Iowa and Massachusetts cover "injuries," the term being not defined. The Wisconsin act covers mental or physical harm caused by accident or disease. The North Dakota act covers injuries by accident and any disease "approximately caused by" employment. In a few states, as in Pennsylvania and Texas, a compensable injury is defined to mean damage or harm to the physical structure of the body and such diseases or infection as naturally result therefrom. Even in the absence of such a definition, under most of the acts compensation is allowed for such diseases as naturally follow from

pensable as an occupational disease. In nine states the acts contain special provisions relating to malpractice by attending physicians.

COMPENSABILITY OF OCCUPATIONAL DISEASES

Just as a workman should receive compensation for an injury which he sustains in the course of his employment, to compensate him in some way for his loss, so also should a workman receive compensation for a disease which he contracts as the result of conditions of his employment. More and more jurisdictions are enacting laws which provide compensation for occupational diseases. Today, twenty-four states provide com-

TABLE 2.—Limitations in Time and Cost of Medical and Hospital Benefits in Compensable Industrial Injuries

State or Federal Law	Maximum Period	Maximum Cost	State or Federal Law	Maximum Period	Maximum Cost
Alabama.....	90 days ¹	\$200	New Jersey.....	Unlimited	\$100 ³
Alaska.....	1 year	Unlimited ²	New Mexico.....	Unlimited	\$400
Arizona.....	Unlimited	Unlimited ²	New York ⁶	Unlimited	Unlimited
Arkansas ⁴	60 days ³	Unlimited	North Carolina.....	10 weeks ³	Unlimited ⁶
California.....	Unlimited	Unlimited	North Dakota.....	During disability	Unlimited
Colorado.....	4 months ⁷	\$500	Ohio.....	Unlimited	\$200 ³
Connecticut.....	Unlimited	Unlimited	Oklahoma.....	60 days ³	Unlimited
Delaware.....	30 days ³	\$150 ³	Oregon.....	Unlimited	\$250 ³
District of Columbia.....	Unlimited	Unlimited	.....	3 months	\$200 ⁹
Florida.....	Unlimited	\$250 ⁸	.....	Unlimited	Unlimited
Georgia.....	10 weeks ²	\$500	.....	Unlimited	Unlimited
Hawaii.....	Unlimited	Unlimited	.....	Unlimited	\$200 ¹⁰
Idaho.....	Reasonable time	Unlimited	.....	10 weeks ³	Unlimited
Illinois.....	Unlimited	Unlimited	South Dakota.....	20 weeks	\$300
Indiana.....	90 days ¹	Unlimited	Tennessee.....	30 days ¹	\$200
Iowa.....	Unlimited	Unlimited	Texas.....	91 days ¹¹	Unlimited
Kansas.....	60 days	\$100 ³	Utah.....	Unlimited	\$500 ³
Kentucky.....	90 days ³	\$200 ³	Vermont.....	2 weeks	\$50 ¹²
Louisiana.....	Unlimited	\$250	Virginia.....	60 days ¹³	Unlimited
.....	30 days ³	\$100 ³	Washington.....	During disability ^{14, 15}	Unlimited
.....	Unlimited	\$300	West Virginia.....	Unlimited	\$500
.....	2 weeks ³	Unlimited	Wisconsin.....	Compensable period ¹⁵	Unlimited
.....	90 days	Unlimited	Wyoming.....	Unlimited	\$300 ¹⁰
Minnesota.....	Unlimited	Unlimited	Longshoremen's and harbor workers' compensation act.....	Unlimited	Unlimited
Missouri.....	90 days ³	\$750	Compensation act for civil employees of United States.....	Unlimited	Unlimited
.....	6 months	\$500 ¹⁷			
.....	Unlimited	Unlimited			
.....	6 months ³	Unlimited ²			
New Hampshire.....	30 days	Unlimited			

Table is based on data in table 7, "Maximum Periods and Amounts of Medical Service, by States," Monthly Labor Review, vol. 47, p. 563, September 1938, supplemented by data in files of Bureau of Legal Medicine and Legislation, American Medical Association.

1. Additional service may be given at option of employer.
2. Employees contribute.
3. Additional service in special cases or at discretion of commission.
4. Operation of law, enacted by state legislature providing compensation for industrial injuries and occupational diseases, is suspended pending outcome of referendum.
5. In case of disability resulting from inhalation of harmful dust, period of treatment is limited to 270 days.
6. Medical or other treatment for asbestosis or silicosis shall be limited to three years and a maximum cost of \$334 a year.
7. In case of hernia, if employee requires operation he is entitled to service without limitation of time.
8. In surgical cases maximum may be increased by order of commission to \$500.
9. Amount is exclusive of hospital treatment and artificial appliances.
10. In case of employee receiving hospital treatment for more than fourteen days, the maximum is \$250.
11. Hospital services may be extended for an additional two weeks on certification of attending physician as to necessity.
12. Also hospital first thirty days, maximum \$150.
13. Extended in unusual cases. Not to exceed 180 days.
14. In case of temporary disability, continues not longer than period of compensation, and in case of permanent disability not beyond the date of award. Employees contribute.
15. Interpreted as unlimited by Wisconsin industrial commission.
16. Additional expenditure of not more than \$150 for medical service and \$150 for hospital treatment may be authorized by court.
17. A special operating fee of \$100 allowed in case of hernia.

an industrial injury. Aggravation of a preexisting disease by injury is usually considered an industrial injury and not an occupational disease. In Connecticut and Florida disability or death due to the aggravation or the acceleration of venereal diseases is not compensable.

Courts have not infrequently allowed compensation, under workmen's compensation acts which make industrial injuries compensable, for conditions, such as lead poisoning, which actually are "occupational diseases." The laws in twenty-five states contain special provisions relating to hernia. A workman suffering from a hernia is required in some states to submit to surgical repair. In many of these twenty-five states the laws specifically define what constitutes a compensable hernia. In Michigan and Rhode Island a hernia sustained in the course of employment is not an accidental injury but is com-

pensation for such diseases. The federal government also allows compensation for such diseases in the District of Columbia and under its compensation laws relating to longshoremen and harbor workers and civil employees of the United States.

As in the case of industrial injuries, compensation for occupational diseases may be compulsory or elective. Likewise the federal laws and most of the state laws providing compensation for occupational diseases are administered by boards, commissions, bureaus, departments or commissioners. In Connecticut there is a single commissioner in and for each of five autonomous districts. In New York the law in some respects is administered by a single commissioner but in other respects by an industrial board. The determinations of these administrative agencies are not final and are always appealable to the courts.

In four states, Idaho, Illinois, Indiana and Pennsylvania, occupational diseases are made compensable under special occupational disease acts which are separate and apart from the workmen's compensation acts of those states. In all of the other jurisdictions which provide compensation for occupational diseases, compensation is based on statutory provisions in workmen's compensation acts or judicial interpretation of such acts. Detailed information relative to the compensability of occupational diseases is set forth in table 1.

An examination of table 1 reveals that fourteen states provide compensation for occupational diseases by specifically describing or enumerating in a schedule the diseases that are covered. Such a schedule may be composed of only a few diseases or it may consist of a large number. In two more states, New York and Ohio, the laws cover a schedule of diseases and "any and all occupational diseases" or "all other occupational diseases" respectively. In all other jurisdictions in which occupational diseases are compensable, including eight states and the District of Columbia, the law covers "occupational diseases" in a general or blanket manner either by defining "occupational disease" in general terms or, for all practical purposes, not defining it at all. In some of the states only occupational diseases occurring in certain designated industries are covered. Most of the laws providing compensation for occupational diseases, either by specific or by general language, may be said also to allow compensation for silicosis and, in many instances, other occupational dust diseases.

To define an occupational disease has proved most difficult. Where a schedule is resorted to, obviously the list of diseases adopted is not likely to be all inclusive and so revisions from time to time will become necessary. One of the better attempts to define an "occupational disease" in general terms is that to be found in the definition of that term in the Illinois occupational disease act, which is as follows:

In this Act the term "Occupational Disease" means a disease arising out of and in the course of the employment. Ordinary diseases of life to which the general public is exposed outside of the employment shall not be compensable, except where the said diseases follow as an incident of an occupational disease as defined in this section.

A disease shall be deemed to arise out of the employment, only if there is apparent to the rational mind upon consideration of all the circumstances, a direct causal connection between the conditions under which the work is performed and the occupational disease, and which can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment and which can be fairly traced to the employment as the proximate cause, and which does not come from a hazard to which workmen would have been equally exposed outside of the employment. The disease must be incidental to the character of the business and not independent of the relation of employer and employee. The disease need not to have been foreseen or expected but after its contraction it must appear to have had its origin in a risk connected with the employment and to have flowed from that source as a rational consequence.³

This definition was incorporated in the occupational disease act of Indiana. The statutory definitions of "occupational disease" at best are none too clear. If no attempt is made in the law to provide a schedule of diseases or to define an "occupational disease," then it is up to the courts to define what is meant by that

phrase. Here again the results have been none too satisfactory. Consequently there is today in many of the states no clearcut legal distinction between "occupational diseases" and "industrial injuries."

MEDICAL AND HOSPITAL BENEFITS

Medical and hospital services which employers or their insurance carriers are required to furnish to industrially injured or occupationally diseased employees constitute the most significant phase of compensation. It is estimated that three fourths of industrial injuries do not involve disability over a sufficiently long period to require cash compensation but that most of these require medical attention and perhaps hospitalization.

All of the laws which provide compensation for industrial injuries or occupational diseases require the employer, or his insurance carrier, to furnish or be financially responsible for, frequently within certain limitations, necessary medical and hospital services to industrially injured or diseased workmen. Most of these laws fix certain maximum limitations, as to time or to cost or to both, beyond which medical or hospital services need not be furnished by the employer or his insurance carrier. A minority of these laws, however, impose no maximum limitation as to either time or cost. While the law may not impose specific limitations and so the medical and hospital care which the employer or his insurance carrier must furnish may be said to be "unlimited," yet such services are subject to this limitation that they must be reasonable, that is, only such as the nature of the injury or condition reasonably requires. In some of the laws, as in Arizona and North Dakota, a limitation of reasonableness is specifically provided. In a few states medical and hospital benefits are limited to the period of disability or period of compensation. Even where limitations exist, commonly provision is made for the administrative agency to remove the limitations, at least in individual cases or unusual cases, and order further treatment or hospitalization either without limit or not beyond an additional limit set forth in the statute.

The maximum limitations imposed as to medical and hospital benefits in compensable industrial injuries are set forth in table 2. There is a definite tendency, especially in recent years, for legislatures to liberalize the provisions in workmen's compensation laws relating to medical and hospital benefits either by abolishing limitations as to time or to cost or to both or by raising the maximum limitation or limitations provided.

The maximum limitations imposed on medical and hospital services which employers or their insurance carriers are required to furnish in compensable occupational diseases are presented in table 3. In three states, Illinois, New York and North Carolina, limitations as to time or cost or both apply only to cases of silicosis or other occupational dust diseases.

FREE CHOICE OF PHYSICIAN

Under the earliest workmen's compensation acts, free choice of physician by an injured workman, except at his own cost, was seldom permitted. In later years there has been a trend toward free choice both in statutory amendments and in administrative practice. In spite of this trend, under federal compensation laws and the laws of most states the employer or insurance carrier or insurance fund still has the right to choose the physician or hospital. In such jurisdictions the industrially injured or occupationally sick worker, if he

3. Smith-Hurd Illinois Annotated Statutes, 1939, ch. 48, sec. 172.6.

desires to be treated free of cost to himself, must accept the physician, hospital or nurse, regardless of competence, tendered by the employer or the employer's insurer. In an emergency, however, the workman may choose his own physician or hospital. Of course, the worker may always choose his physician without cost to himself whenever the employer or his insurance carrier refuses, on demand, to furnish necessary medical or hospital services. The employee may always be treated by a physician of his own choosing at his own expense, but that can hardly be said to be any free choice of physician. In such jurisdictions the employers or insurance carriers may of their own initiative prepare panels of physicians from which the employee may select a physician.

According to the files of the Bureau of Legal Medicine and Legislation, the employee has the right to select a physician of his own choice in comparatively few of the states. In Massachusetts and Rhode Island the worker has the right unconditionally to select a physician of his own choosing. In Minnesota the workmen's compensation act has been construed to permit the worker to select his own physician, although the language of the act is similar to that of other state acts which have been construed as denying free choice. In Utah the law provides that the employee may select his own physician, unless the employer has arranged for medical services by contract and has posted such contract in and about the premises where the workman is employed. This act has also been construed to give the worker the right of selection. In North Carolina and Vermont the employee may select a physician of his own choosing subject to the approval of the workmen's compensation board. In three states, Wisconsin, California and New York, the worker may select his physician from a panel or list of physicians. In Wisconsin the employee has the right to select his physician from a panel prepared and posted by the employer. In California the law requires the employer to tender the employee on his request one change of physicians and to nominate at least three additional competent physicians, or as many as may be available if three cannot reasonably be named, from whom the employee may choose. Also the employee is entitled, on request, to a consulting physician to be provided by the employer in any serious case. In New York the employee may select his physician from a panel or list of physicians, approved and authorized by the state industrial board to render medical care to injured or sick workmen. However, the industrial commissioner is required, on the recommendation of any county medical society or of a board representing physicians of any other school of medical practice, to authorize physicians licensed to practice medicine in the state to render such medical care. The New York law thus almost entirely places on the local medical societies the responsibility for the quality of medical care. In Connecticut and Nebraska, while the employer has the right to designate the physician in the first instance, in all cases involving dismemberment or a major surgical operation the employee may designate the operating surgeon. A workman in Pennsylvania, after petition to the workmen's compensation board and notice to his employer, may consult a physician of his own choice at any time during his disability, the cost of such consultation to be paid by the employer in accordance with the schedule of charges prescribed and approved by the board. Although it is possible that administrative boards in a few states,

by administrative ruling, may permit employees to select physicians of their own choosing, no discussion of such administrative practice will be presented here.

The right of an industrially injured or occupationally sick workman to choose the physician who shall treat him is a highly controversial subject. The real question involved is How can competent medical service best be obtained? It is a fundamental principle of medical ethics that the patient, if he is to have adequate medical care, shall have free choice in selecting his physician. The argument sometimes advanced that a workman is unable to make a good choice of a physician to treat him, while perhaps true in some cases, overlooks the fact that the workman's vital interest in the

TABLE 3.—Limitations in Time and Cost of Medical and Hospital Benefits in Compensable Occupational Diseases

State or Federal Law	Maximum Period	Maximum Cost
Arkansas ¹	90 days ²	Unlimited
California.....	Unlimited	Unlimited
Connecticut.....	Unlimited	Unlimited
Delaware.....	30 days	\$150
District of Columbia....	Unlimited	Unlimited
Idaho.....	90 days ²	Unlimited
Illinois.....	6 months ³	Unlimited
Indiana.....	30 days ⁴	Unlimited
Kentucky.....	90 days	\$200 ⁵
Maryland.....	Unlimited	\$500 ⁶
".....	14 days ⁷	Unlimited
".....	90 days	Unlimited
".....	Unlimited	Unlimited
Massachusetts.....	90 days ⁸	\$750 ⁹
Nebraska.....	Unlimited	Unlimited
New Jersey.....	Unlimited	\$50; medical; ¹⁰ \$50; hospital ⁹
New York.....	270 days ³	Unlimited
North Carolina.....	3 years ³	\$334 a year ³
North Dakota.....	Unlimited	Unlimited
Ohio.....	Unlimited	\$200 ⁷
Pennsylvania.....	60 days; medical; unlimited; hospital	\$150; medical; unlimited; hospital
Rhode Island.....	Unlimited	\$200 or \$250 ¹⁰
Washington.....	Compensable period ⁸	Unlimited
West Virginia.....	Unlimited	\$800 ¹¹
Wisconsin.....	Compensable period ¹²	Unlimited
Longshoremen's and harbor workers' compensation act.....	Unlimited	Unlimited
Compensation act for civil employees of U. S.	Unlimited	Unlimited

Table is based on data in chart V, "Workmen's Compensation: Occupational Disease," and chart VI, "Workmen's Compensation: Sickness," as of Jan. 1, 1933, Division of Labor Statistics, U. S. Department of Labor, supplemented by data in files of Bureau of Legal Medicine and Legislation, American Medical Association.

1. Operation of law, enacted by state legislature providing compensation for industrial injuries and occupational diseases, is suspended pending outcome of referendum.

2. May be extended to 180 days.

3. Limitation applies only to dust diseases.

4. May be extended to sixty days.

5. May be increased to \$400.

6. Probably limited to this amount as in the case of accidental injuries.

7. May be extended in unusual cases.

8. May be extended.

9. May be increased.

10. Depending on length of hospitalization.

11. May be increased to \$1,600.

12. Interpreted as "unlimited" by Wisconsin industrial commission.

preservation of his health and earning capacity and prolongation of his life is a supreme inducement to a wise choice of an attending physician. The contention that employers are better able to judge the qualifications of physicians than are their employees might have some force were all employers conscientious, high minded and well meaning persons interested in the welfare of their employees and experienced in selecting competent physicians. While it is probably true that during the last ten or twenty years many employers have swung from cheap inadequate medical service to good medical service, no matter what the cost, because they have learned that cheap medical service in the long run is

expensive medical service, it must be remembered that compensation laws apply to all types of employers and to industries in the sparsely populated areas as well as in the metropolitan centers. Also the majority of industries depend on insurance companies to supply the medical and hospital care required. An employer interested in the welfare of his workmen should realize that, where employees are allowed to choose between the medical service established by the employer in his plant and the medical service obtainable elsewhere, a healthy competition is stimulated between his own physicians and those on the outside. It should not be overlooked that absolute denial to the employee of the right to choose his

questions of a purely medical nature should be passed on by those who have met the standards of medical qualifications required by law and who alone have been pronounced capable of passing on such questions.⁴

According to Marshall Dawson,⁵ of the Bureau of Labor Statistics of the U. S. Department of Labor, as of Jan. 1, 1938, in twenty-one states the workmen's compensation authority had a medical staff, but with full-time officers in only eight instances. He further states that most of the industrial commissions, in case of medical dispute or apparent prejudice, have authority to select an independent physician to examine the worker, but in several instances commissions reported

TABLE 4.—*Determination of Medical Matters Under Laws Providing Compensation for Occupational Diseases*

State or Federal Law	No Provision	Provision for Medical Board	Other Provisions
Arkansas.....	..	Medical board of 3 members; findings advisory	.....
California.....	Commission may appoint special examiners; findings advisory
Connecticut.....	+
Delaware.....	+
District of Columbia.....	+
Idaho.....	..	Medical panel of 6 members for silicosis and of 3 members for other diseases; appointed by industrial accident board; findings advisory	.....
Illinois.....	Commission may appoint special examiners; findings advisory
Indiana.....	Industrial board may appoint examiners or other experts
Kentucky.....	Compensation board may, and on application appoint 2 to 3 examiners in silicosis
Maryland.....	..	Medical board of 3 members; findings advisory	.....
Massachusetts.....	..	Medical board of 3 medical referees; diagnosis binding	.....
Michigan.....	In disputed cases department may appoint 3 impartial physicians; majority decision final
Minnesota.....	Commission may appoint special examiners
Missouri.....	Commission may order medical examinations
Nebraska.....	+
New Jersey.....	+
New York.....	..	Medical board of 3 members for dust diseases; findings advisory	.....
North Carolina.....	..	Medical board or committee of 3 members; findings advisory; supervise periodic examinations for exposure to dust diseases	.....
North Dakota.....	Compensation bureau may appoint special examiners
Ohio.....	..	Medical boards of review; findings binding on commission; 3 silicosis referees; findings advisory	.....
Pennsylvania.....	..	Medical board of 3 members selected by secretary of labor and industry with approval of governor; findings advisory	.....
Rhode Island.....	Director of labor shall appoint special examiners
Washington.....	Department may require examination
West Virginia.....	..	Medical board of 3 members appointed by commissioner; findings advisory	.....
Wisconsin.....	Commission may appoint examiners
Longshoremen's and harbor workers' compensation act	+
Compensation act for civil employees of U. S.....	+

Table is based on data in chart V, "Workmen's Compensation: Occupational Disease," as of Jan. 1, 1938, Division of Labor Statistics, U. S. Department of Labor, supplemented by data in files of Bureau of Legal Medicine and Legislation, American Medical Association.

1. Operation of law, enacted by state legislature providing compensation for industrial injuries and occupational diseases, is suspended pending outcome of referendum.

own physician in that respect reduces the workman to the status of a machine or puppet in the hands of the employer or the employer's insurer. No injured workman should be denied the right to be treated by a physician of his own choice if he so desires.

ROLE OF PHYSICIANS IN ADMINISTRATION OF COMPENSATION LAWS

An agency administering laws providing compensation for industrial injuries or occupational diseases or both can hardly competently or efficiently make determinations involving medical aspects of compensation without representation on such administrative boards of doctors of medicine or without the aid of a medical board, medical advisers, medical consultants or impartial medical examiners. And yet many such agencies do just that. There should be medical representation proportionate to the medical interests involved, because

lack of funds to pay for examinations which they do not consider properly chargeable to the employer or insurance carrier. The methods provided for the determination of medical matters under laws providing compensation for occupational diseases are discussed in table 4.

REPORTING OF INDUSTRIAL INJURIES AND OCCUPATIONAL DISEASES

Laws providing compensation for industrial injuries and occupational diseases often specifically impose on physicians treating industrially injured or occupationally diseased workmen the duty to render reports usually on forms provided for that purpose, to the

4. Medical Relations Under Workmen's Compensation, Revised Report prepared by the Bureau of Medical Economics, American Medical Association, Chicago, 1935, ch. IX, p. 144.
5. Bureau of Labor Statistics Serial No. R. 867; Medical Aid to Workmen's Compensation Laws, United States Government Printing Office, Washington, D. C., 1939, p. 16.

workmen's compensation board or other administrative agency or to the employer or to both. Under some circumstances, physicians may be required by compensation laws to render reports to injured or sick employees. Aside from compensation laws, physicians are not infrequently required, by laws primarily relating to reporting of communicable diseases, to report occupational diseases to state boards or departments of health. Also the compensation laws of a large number of states require employers to report industrial injuries and occupational diseases to the workmen's compensation board or other administrative agency. Because the employer in rendering such reports must rely on physicians for details of injury and disease, it is not unlikely that the employer, by contract of employment or otherwise, will require industrial physicians to render reports to him. Under such circumstances the industrial physician should render such reports to the employer even though he is not required by law or by contract to do so.

For cogent reasons, all industrial injuries and occupational diseases should be required by law to be reported. Such reporting is necessary to prevent and control effectively such injuries and diseases as far as that is possible. Such reporting also furnishes valuable data for statistical and scientific purposes.

MEDICAL TESTIMONY IN COMPENSATION CASES

In any discussion of the legal and medicolegal aspects of compensation for industrial injuries and occupational diseases some mention should be made of the difficulty of obtaining reliable impartial medical testimony in compensation cases before workmen's compensation boards or before the courts. The medical profession, by medical opinions that are false or biased or founded on inadequate medical information and on possibilities rather than probabilities, has extended, more or less innocently, the scope of compensation. Uniform standards of evaluating injury or disease are urgently needed, as the American Medical Association has done with respect to appraisal of loss of visual efficiency. Better instruction in medical schools in industrial and legal medicine should do much to solve this problem.

Irrespective of the status or availability of accurate scientific information in the field of industrial medicine, medical testimony in compensation cases all too frequently is unreliable because of the medical witness himself. It is a most trying task for a medical witness to be absolutely unbiased and candid. To begin with, he is called to testify because his opinion is known to be favorable to the party calling him. If the medical witness was employed by the injured or diseased workman to treat him, he must be a man of great integrity to overcome the temptation to testify in such a manner as to help out the workman, especially since there may be financial gain to him if disability is prolonged. All too frequently, not only workmen and lawyers but also physicians attribute real or assumed pathologic conditions to trauma simply because such conditions appeared after an accident. This is not so strange when one recalls that in primitive times, long before the days of medicine, man because of his superstitious nature blamed external influences over which he had no control, such as gods, evil spirits and heavenly planets, for most of his bodily infirmities. Overreliance on medical and medicolegal textbooks is also responsible for some of the mistaken or unreliable medical testimony, because the authors too frequently round out their discussions

of the etiology of pathologic conditions by adding, without scientific justification, the words "and injuries" or "also due to injuries," statements which had been copied and recopied from predecessors of even decades before. On the other hand, if the medical witness was or is employed by the employer of the injured or diseased workman, many factors, economic and otherwise, likewise come into play to tend to influence his testimony and make it favorable to the contentions of the employer. Indeed, it requires a physician of stern conscience and rigid integrity to resist all these various influences and testify to the truth and nothing but the truth.

Untrustworthy medical testimony in compensation cases, which is due to the incompetence or fault of the medical witness himself, may be of four types: (1) Where the physician, because of ignorance or lack of proper preparation, makes an honest error; (2) where the physician is so emotionally disturbed as to become confused and makes honest mistakes; (3) where the physician dishonestly makes a guess instead of frankly confessing his lack of medical knowledge, and (4) where the physician, perhaps one biased by his employment but more frequently a so-called professional expert medical witness who makes his living by deliberately giving false expert medical testimony, testifies falsely. Lawyers and judges use the professional expert witness only when they have to, but they do not respect him. His position, while perhaps lucrative, is certainly an unsavory one. His conduct has brought discredit to the medical profession and has done much to make honest physicians shun the courts.

In compensation disputes tried before courts of law the competence of medical witnesses is primarily the responsibility of the judge as he is the one who passes on their qualifications. High standards of qualifications for medical witnesses should be set and compliance with those standards should be required. Close cooperation in the matter of qualifications of medical witnesses between courts and the medical profession through local medical societies would seem to make for more reliable medical testimony. The feasibility and possible advantages of laws specifically authorizing courts to appoint nonbiased medical boards, composed of duly licensed and qualified doctors of medicine, to pass on questions requiring medical knowledge, would seem to be a fertile field for study. Likewise, the advantages in disputes before workmen's compensation boards of establishing medical boards or medical advisers, as some states have already done, to pass on medical questions, such as the relation of disability to trauma and the evaluation of disability, also merit earnest deliberation.

This discussion has touched only a few of the many legal and medicolegal phases of compensation laws of prime importance to physicians interested in the field of industrial medicine.

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A Day's Sport.—A man's hobby must be something which his soul loves. Nor is its value measured only by the hours spent in its indulgence, since no small part of its benefit comes from pleasurable anticipation of joys to come or happy memories of past triumphs. Such relaxations afford relief to restless brains at unexpected times. How often have I gone to bed with a mind jaded and sleepless from medical worries, when pleasant thoughts of a day's sport have wiped the slate clean and sent me into sound sleep.—Smith, Lewis, in *Doctors in Shirt Sleeves*, edited by Sir Henry Bashford, London, Kegan Paul, Trench, Trubner & Co., Ltd., 1939.

Clinical Notes, Suggestions and New Instruments

ROENTGENOLOGIC DEMONSTRATION OF LOCALIZED GAS IN CAISSON DISEASE

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The condition caisson disease, described as compressed air disease and divers' paralysis and commonly spoken of by the laborers as "bends," has been known for a long time. It is generally regarded as being due to a saturation of the tissues with nitrogen gas, followed by too rapid decompression, which allows the escape of bubbles of nitrogen into the tissues and into the blood stream, causing air embolism.

The disease was first studied by the French writers Bucquay, Foley and Bert during the latter part of the nineteenth century. Since that time important contributions to the subject have been made by Leyden, Haldane, Hill, Boycott, Smith and others.

The disease is encountered chiefly among workers in caissons and tunnels and in divers. It may also occur in very deep mines. The higher the pressure and the shorter the period of decompression, the greater the risk of precipitating an attack.

During compression, the air passing to the lungs is saturated with nitrogen under pressure. The nitrogen is carried to the tissues until the entire body is saturated. It has been shown by Haldane and Smith that the blood is 5 per cent of the body weight. Haldane has also shown that approximately one minute is required for the blood to return to the heart. During compression the capacity of the blood to take up nitrogen increases approximately 1 per cent for each additional atmosphere of pressure. If every part of the body was equally supplied with blood and the blood was one twentieth of the body weight, theoretically saturation would be complete in twenty circulations. Actually this is not true. The blood returns to the heart each time with a saturation equal to that of the tissues. Thus each time its power to receive additional nitrogen is lessened. In addition, 20 per cent of the body is composed of fat and Vernon has shown that fat takes up five times more nitrogen than ordinary body fluids. Haldane has estimated that half saturation takes place in fifteen minutes and that almost an hour



Fig. 1.—Gas in synovial sacs about three hours after injury.

is required for complete saturation. Saturation becomes more rapid during labor, because of the increased speed of the circulation.

During decompression the action is the reverse of the process just described. Supersaturated tissues give off nitrogen to the blood, which is desaturated by the lungs. This process keeps up until atmospheric equilibrium has been reached. Should the decompression take place too rapidly to allow this desaturation, gas bubbles of nitrogen will form in the body fluids and tissues. This formation of gas bubbles is the accepted theory, at present,

of caisson disease. These bubbles form first in the venous blood, fatty tissues, synovial fluids of the joints, and the nervous system.

The symptoms may vary from headache, dizziness and feeling faint to nausea and vomiting or, in extreme cases, coma followed by death in a few hours. There is severe pain, usually in the legs and in the abdomen. Paralysis is rather common and usually transitory in the slight cases. Late changes are injury of the spinal cord, chronic arthritis and deafness.

Prophylaxis consists solely in gradual decompression and regulation of the shifts. It was early found that immediate recompression was the best remedy. Workers should live and



Fig. 2.—Resorption of gas six weeks later.

sleep near the works, where an air-lock is provided for immediate treatment. The inhalation of oxygen, under pressure, has been shown to reduce the partial increased pressure of nitrogen in the blood and thereby increase absorption of nitrogen by the blood. Morphine is frequently required for relief of pain, and in extreme cases circulatory stimulants are required along with the usual treatment for shock.

REPORT OF CASE

P. D., a white man, aged 30, employed as a tunnel worker, was admitted to St. Joseph Hospital, Memphis, Tenn., Nov. 19, 1938, complaining of severe pains in both lower extremities. Just prior to admission, while working in a tunnel, he was struck across both legs at about the level of the knee joints by a loaded "dinky tunnel car" as it overturned. He was working under 25 pounds of pressure at the time of the accident. Because of severe pain he was removed from the tunnel without spending the customary time in the decompression chamber. He gave a history of having been employed as a tunnel worker for six years and had on several previous occasions had "bends." There had been an injury to the right ankle in 1936.

On admission to the hospital at 2 a. m. he was seen by Dr. J. C. Ayres Jr., the associate of one of us (J. O. G.). He was complaining of severe pain in both knees and thighs. Because of the confusion and haste incident to removing him from the tunnel and bringing him to the hospital, he could not state definitely whether the pain immediately followed the accident or not. Later in the morning he stated that the severe lancinating pains were the same as he had experienced on previous occasions when he had had attacks of the "bends." More morphine was required to control his pain than is usual in fractures of the tibia. He did not complain of headache, dizziness or nausea.

Immediately after admission he was taken to the roentgenologic department for examination of both knees. This examination revealed irregular linear fractures of the upper ends of the tibiae of both legs. On the right side the line of fracture involved the articular surface of the knee joint. There was no gross deformity or displacement of the fragments at either site. There was gas in the synovial sacs of both knees. This was believed to be due to the rapid expansion of the nitrogen molecules in the blood stream and the escape of this gas into the capsule (fig. 1).

At the physical examination the patient complained of severe pain in both legs at the level of the knee joints. This was aggravated by the slightest motion and by superficial palpation. There was swelling and ecchymosis about both knees and crepitus was easily elicited. Otherwise the examination was negative.

After the roentgenologic examination, Thomas splints were applied to both legs and morphine sulfate one-fourth grain (0.016 Gm.) was given for the pain. Urinalysis showed a trace of albumin and a few pus cells and bacteria. There were 14,250 white blood cells with 77 per cent polymorphonuclear leukocytes and 33 per cent lymphocytes.

The day following admission, plaster casts were applied from the mid thigh down. Convalescence was uneventful from this time on, and a check-up x-ray examination on December 29 (fig. 2) showed the fragments of both tibias in good position. Bony union was fairly firm. All the gas in the synovial sacs had been absorbed and apparently there had been no permanent injury to the joints. The patient was discharged from the hospital Jan. 7, 1939, and he returned to work exactly twelve weeks after the injury.

We have been unable to find any mention of a case in the literature in which the diagnosis was supported by x-ray examination.

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LEATHER BUFFERS' NODES

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Bernardino Ramazzini first called attention to the value of recognizing trade stigmas in the diagnosis of occupational dermatoses. Although many of the stigmas since recorded are merely fortuitous lesions which do not affect all or even a majority of workers in a trade, the stigma reported in this article affected each of the eleven workers employed at hand buffing of leather in a large tannery investigated. This stigma occurs at a constant site, is always bilateral and is characteristic.

The hand buffing of leather is a highly specialized but fast disappearing craft. Now that machines are replacing hand labor in this operation there are not more than fifty of these craftsmen remaining in the United States. These workers move from one tannery to another to supply temporary demands for their

tannery workers. Even now, hand buffers work shorter hours than other tannery workers and limit their output to a certain number of sides (hides) daily.

Buffers' nodes, or calluses, as they are called by the workers, are a transient stigma as contrasted with permanent stigmas. When the worker goes on a month's vacation much of the node



Fig. 2.—Process of hand buffing leather.

disappears. On his returning to work, until a new callus forms the site is again painful on rubbing, just as it was when the buffer was serving his apprenticeship. About three weeks is required for the development of a nonsensitive node.

The lesions are bilateral and occupy the major portion of the dorsal surface of the distal phalanx of the first digits of each hand. The individual node is round to oval, approximately from 1.5 to 2 cm. in diameter and 6 mm. in thickness. Figure 1 is the reproduction of a close-up photograph of the thumbs of three hand buffers.

In the operation of hand buffing the worker grasps a knife, known as a buffing slicker, having a cornuate wooden handle and a thin rectangular steel blade approximately 4 inches by 6 inches by $\frac{1}{8}$ inch (10 by 15 by 0.3 cm.). The edge of the slicker is hollow ground and must be sharpened by running a long thin round file along its edge. This knack is both difficult to acquire and difficult to retain. Some of the workers lose the knack either temporarily or permanently and must then have a fellow worker sharpen the blade.

The hand buffer grasps the slicker with the thumbs under and the other fingers of each hand over the steel blade. The palmar surfaces of the hands are pronated on the uppermost surface of the slicker. The nodes which constitute the hand buffers' stigma result from the necessity of having the thumbs slide firmly over the surface of the leather in order to gauge the depth to which the buffing slicker shaves. Figure 2 illustrates the process of hand buffing leather and exhibits a thinly shaved ribbon which has been partially removed by a stroke of the slicker.

SUMMARY

During the buffing of hides, characteristic bilateral calluses invariably develop on the dorsum of the thumbs of leather buffers as a result of friction.

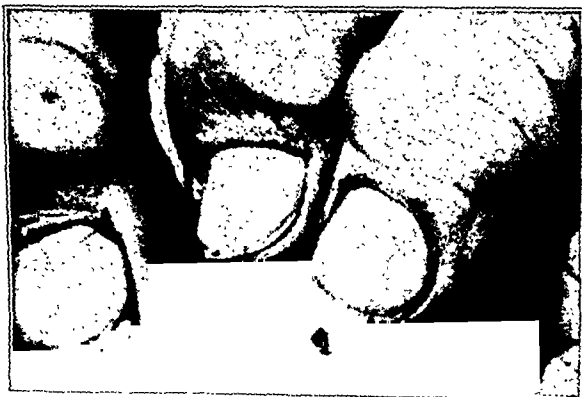


Fig. 1.—Thumbs of three hand buffers.

services in the buffing of certain types of leather. This operation is necessary for the removal of briar scratches, wire fence scratches, manure grain, tick bites and fly bites. The types of leather which require hand buffing are retan, harness, horse collar and horse butts, from which genuine cordovan leather is prepared. Hand buffers constitute a pseudoguild into which few apprentices are taken. Formerly the hand buffer came to work in frock coat and topper and was the aristocrat of the

From the Office of Dermatoses Investigations, United States Public Health Service, Medical Director Louis Schwartz in charge.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

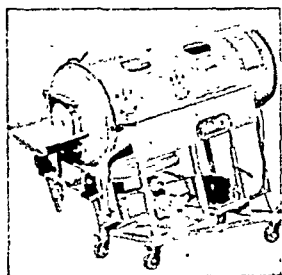
DRINKER-COLLINS ADULT RESPIRATOR ACCEPTABLE

Manufacturer: Warren E. Collins, Inc., 555 Huntington Avenue, Boston.

The Drinker-Collins Improved Adult Respirator is a device for producing artificial respiration simulating natural breathing for indefinite periods of time. A similar model has been accepted by the Council since 1931 (THE JOURNAL, May 9, 1931, p. 1580). Since that time certain improvements and changes have been made.

The unit functions by alternately producing a slightly sub-atmospheric and atmospheric (occasionally slightly positive) pressure in the chamber which encloses all the body except the head. The lungs are inflated during the negative pressure phase and passively deflated during the atmospheric pressure phase. The apparatus consists of a cylindric steel chamber mounted on a welded steel framework, which also supports the operating mechanism. The chamber contains a cot attached to the removable head-end closure. Casters on the legs of this closure and on the cot facilitate rolling the cot from the chamber for placing patients in the respirator. The respirator is mounted on casters so that it may be moved conveniently.

There are several models of this unit. In the Standard Model, the chamber is fixed in a horizontal position and is 28 inches in diameter throughout. In the Tilting-Rotating Model, means are provided for elevating the foot end of the chamber and tilting the cot toward either side to facilitate drainage of the respiratory tract. The Orthopedic Model embodies these features of the Tilting-Rotating Model and in addition is enlarged to a diameter of 42 inches at the head end, enabling use of "airplane splints" and other orthopedic appliances. In all models the interior length is 70 inches. Since the head is outside, persons up to about 6½ feet in height may be accommodated.



Drinker-Collins Adult
Respirator.

The net weight of the Standard Model is 470 pounds, of the Tilting-Rotating Model 540 pounds, and of the Orthopedic Model 760 pounds. Shipping weights (via Railway Express, wrapped but not crated) are 500, 570 and 800 pounds respectively, and by freight (boxed) 900, 970 and 1,300 pounds respectively.

The chamber of the unit is provided with five arm openings provided with sponge rubber diaphragms thus making possible

various operations inside the chamber without interference with the respiration of the patient. Easily closed covers seal the arm openings when not in use. A larger opening is provided for the insertion of bed clothing and other articles. Four observation windows are equipped with nonbreakable panes. Other features include a rubber-covered mattress, a protected light bulb to illuminate the interior and an adjustable head rest and sponge rubber collar.

The pump consists of a corrugated rubber "accordion" style bellows, actuated by levers from a heavy-duty worm reduction unit connected by a variable speed drive to a one-fourth horse power electric motor. The bellows may also be operated by hand. The range of operating speeds when the motor is in use is about 14 to 28 respirations per minute. The motor is furnished for alternating or direct current as specified. A recessed control panel is mounted on the side of the respirator and bears the switches for the motor and light, the diaphragm type dial pressure gage, a positive pressure control and an overall pressure control to regulate both negative and positive pressures. The power consumption depends on the pressure used and on the rate of respiration. Under normal conditions it averages 200 watts.

Questionnaires were sent out by the Council to physicians and hospitals listed by the firm as having had experience with the unit. Eighteen replies were received, giving favorable data on the efficiency and durability of the apparatus. All the reports cited experience with the apparatus of at least several years' duration and included many cases.

The unit was submitted to a qualified physician for the purpose of clinical trial. A summary of the results of the Council investigation is as follows:

In comparison with the earlier model of the respirator, the new model is lighter and more attractive in appearance and it is quieter in operation on account of substitution of the bellows for the metal pump. A change from the sixteen small clamps on the old model to three large clamps used when sealing the head and cot in position for operation is a great improvement. The elevator screw for adjusting the level of the patient's head is also a good device which was not present originally. The instrument panel is an added convenience. A metal bar provided for hand operation of the bellows in case there is failure of electric current is another new factor which might be of vital importance. There is no question that this new model respirator is a much better machine than its predecessors from the standpoint of design, operation and convenience in adjustment.

The Council on Physical Therapy voted to accept the Drinker-Collins Improved Adult Respirator for inclusion on the Council's list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS FORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

LIQUID PETROLATUM (See New and Nonofficial Remedies, 1939, p. 300).

The following dosage forms have been accepted:

Emulsion Liquid Petrolatum, Chocolate Flavored: A palatable emulsion containing 60 per cent (by volume) of liquid petrolatum, 1 per cent agar agar per fluidounce and 0.1 per cent of benzoic acid added as preservative.

Prepared by the Smith-Dorsey Company, Lincoln, Neb. No U. S. patent or trademark.

Emulsion Liquid Petrolatum with 1½ grains Phenolphthalein per fluid ounce, Chocolate Flavored: A palatable emulsion containing 60 per cent (by volume) of liquid petrolatum, 0.097 Gm. (1½ grains) of phenolphthalein-U. S. P., 1 per cent of agar agar per fluidounce and 0.1 per cent of benzoic acid added as preservative.

Prepared by the Smith-Dorsey Company, Lincoln, Neb. No U. S. patent or trademark.

Emulsion Liquid Petrolatum with 5 grains Phenolphthalein per fluid ounce, Chocolate Flavored: A palatable emulsion containing 60 per cent (by volume) of liquid petrolatum, 0.32 Gm. (5 grains) of phenolphthalein-U. S. P., 1 per cent agar agar per fluidounce and 0.1 per cent of benzoic acid added as preservative.

Prepared by the Smith-Dorsey Company, Lincoln, Neb. No U. S. patent or trademark.

THIAMIN CHLORIDE (See New and Nonofficial Remedies, 1939, p. 498).

The following dosage form has been accepted:

Thiamin Chloride Tablets-Stearns, 1.0 mg.: Each tablet represents 333 U. S. P. units of thiamin chloride.

Prepared by Frederick Stearns & Co., Detroit, Mich.

CONCENTRATED POLLEN EXTRACT-ABBOTT (See New and Nonofficial Remedies, 1939, p. 37).

The following dosage form has been accepted:

Mixed Grass Concentrated Pollen Extract-Abbott (Blue Grass, Timothy, Orchard Grass, Red Top, and Sweet Vernal Grass in equal parts).

Prepared by Abbott Laboratories, North Chicago, Ill.

MANDELIC ACID (See New and Nonofficial Remedies, 1939, p. 313).

Mandelic Acid-Merck.—A brand of mandelic acid-N. S. R.

Manufactured by Merck & Co., Inc., New York. No U. S. patent or trademark.

INDUSTRIAL HEALTH

A GENERAL STATEMENT OF MEDICAL RELATIONSHIPS IN INDUSTRY PRESENTED BY THE COUNCIL ON INDUSTRIAL HEALTH

The Council on Industrial Health was created in 1937 as a standing committee of the Board of Trustees of the American Medical Association to assist the physician individually and through the agencies of medical organization to enlarge and improve his contribution to the health of the industrial worker. In recognition of the essentially educational nature of its functions the Council has accumulated information derived from a variety of sources which, together with investigations undertaken on its own account, are submitted in this special issue of *THE JOURNAL*. The complexity of relationships not only in industry itself but among the many organizations which are attempting to solve the health problems of the worker makes it impossible to include in this introductory discussion all the aspects of industrial health in which physicians, in one way or another, are interested. The Council acknowledges the assistance which it has received from physicians and other sources in the preparation of this subject matter.

It would be difficult to discover any field in the basic or clinical medical sciences which has not contributed to or been affected by health problems in industry. Nevertheless external influences, mostly socio-economic in nature, have played a considerable part in directing this interest into effective channels. These factors, mostly growing out of the increasing complexity of industrial and technologic development, have expressed themselves in a long train of social legislation. One phase of this legislation which has affected the medical profession particularly stems from the concept that injuries and diseases arising out of or occurring in the course of employment are chargeable to industry as part of the cost of production. This attitude has been implemented by the enactment of workmen's compensation statutes. Once adopted, compensation laws have forced on industry and the medical profession the realization that the majority of industrial accidents and unhealthful exposures are in the main preventable. Likewise it has become apparent that improved health of the worker through medical supervision and engineering control of industrial environment, as a rule, favorably affects rates of industrial production.

The period over which workmen's compensation laws have exerted an influence on medical practice in the United States covers about thirty years. The entire development of purposeful health control over workers, therefore, falls well within the professional experience of many physicians in practice today. The early reliance on curative and reconstructive measures lumped under the general heading of compensation practice is no longer sufficient. Only through the principles of preventive medicine can the physical and environmental status of working people be successfully improved. The range of interest, therefore, has grown immeasurably under the double impulsion of humanitarian and economic influences not alone in clinical fields but in improved organization, administration and investigation. The principal manifestations of this expanding

program currently are the incorporation of occupational diseases into workmen's compensation coverage and the growing conviction that many of the problems of adult hygiene have occupational implications that can be most successfully combated by using the industrial approach.

THE SCOPE OF INDUSTRIAL HEALTH

Industrial health is an inclusive term, incorporating three major types of activity.

1. Medical and surgical care to accomplish prompt restoration to health and earning capacity following industrial accident or disease.
2. Prevention of disease or injury in industry by the establishment of proper control over industrial environment.
3. Education of employees about healthful living, both in and out of the industrial environment.

Industrial health, then, in the broad use of the term, is a composite of current knowledge drawn from medicine, surgery, nursing, sanitation and health education.

TABLE 1.—*Gainful Workers 10 Years Old and Over, by General Divisions of Occupations and Sex, for the United States, 1930*

	Total	Male	Female
All occupations.....	48,829,920	38,077,804	10,752,116
Agriculture.....	10,471,998	9,562,059	909,939
Forestry and fishing.....	250,469	250,140	329
Extraction of minerals.....	984,323	983,564	759
Manufacturing and mechanical industries.....	14,110,632	12,224,345	1,886,307
Transportation and communication..	3,843,147	3,561,943	281,204
Trade.....	6,081,467	5,118,787	962,680
Public service (not elsewhere classified).....	856,205	838,622	17,583
Professional service.....	3,233,884	1,727,650	1,526,234
Domestic and personal service.....	4,032,451	1,772,200	3,180,251
Clerical occupations.....	4,025,324	2,038,494	1,986,830

Fifteenth Census of the United States: 1930, Occupation Statistics.

A real understanding of industrial health must be based on a recognition of the part which each of these components plays and the relationships which practicing physicians have established or should establish with them.

POPULATION GROUPS INVOLVED

Another expression of the scope and importance which industrial health has come to occupy rests principally on the great numbers of the population involved. The first table illustrates the divisions and subdivisions of the gainfully employed by sex and by major occupational classification. These figures, while they are inapplicable today because of considerable shifts in employment, still provide some insight into the relative distribution of wage earners according to occupation. Fifty million people represent 39.8 per cent of the total population and nearly 50 per cent of the population 10 years old and over. Any program which has as its principal objectives the improvement of the health of such a large segment of the population must necessarily be of paramount importance to the medical profession.

THE UNEVEN DISTRIBUTION OF INDUSTRIAL HEALTH SERVICES

The dangerous trades are largely concentrated in the manufacturing, mechanical and mining industries, which provide employment to about fifteen million wage earners. These groups, as a result, have received the greatest amount of attention from industrial physicians and

TABLE 2.—*Industrial Establishments Classified According to Number of Wage Earners in the United States*

Establishments Employing	Number of Establishments	Number of Wage Earners
No wage earners.....	6,885	
1 to 5 wage earners.....	62,164	170,174
6 to 20 wage earners.....	46,402	514,457
21 to 50 wage earners.....	23,138	750,922
51 to 100 wage earners.....	11,911	852,373
101 to 250 wage earners.....	9,745	1,522,670
251 to 500 wage earners.....	3,911	1,363,000
501 to 1,000 wage earners.....	1,660	1,333,323
1,001 to 2,500 wage earners.....	737	1,080,234
2,501 or more wage earners.....	241	1,181,748
Totals.....	166,794	8,569,231

U. S. Census of Manufactures, 1937.

hygienists. Of the hundreds of listed occupations which are considered potentially hazardous to health, a major portion will be found in these occupational classifications. Attention needs to be directed to other classes of wage earners in order to identify and control such unhealthful exposures as may exist. Of equal importance is the uneven application of industrial hygiene as between large and small manufacturing plants. Plants

and satisfactory both to those who supply the service and to those who receive it, a substantial level of medical achievement will have been reached.

EFFECTS OF OCCUPATION ON HEALTH

The clearest evidence of direct relationship between occupation and life expectancy lies in the excessive accident and disease rates which attach to certain employments. For example, loggers, structural ironworkers, riggers and explosive makers are subjected to such unusual risks as to make them either ineligible for life insurance protection or acceptable only at much higher premium rates. Workers in dusty trades find themselves in a similar position, as do those exposed to industrial poisoning or to the hazardous effects of other industrial environments either by direct effect or through increased incidence of tuberculosis, pneumonia, cancer and possibly other degenerative diseases. Many statistical approaches have been undertaken to appraise the general effects of occupation on mortality, including the study of labor union records, reports of workmen's compensation agencies and insurance companies, and death certificates. None have proved entirely satisfactory. The absence of uniform and usable statistics is a serious obstacle to a rational attack on those occupational factors which most closely affect the public welfare. Statisticians have attempted to throw some light on the subject by grouping data referring to specific occupations into broader socio-economic classifications. The most recent study in this country along these lines has been prepared by Whitney, drawn from mortality data in the 1930 United States Census and published by the National Tuberculosis Association (table 3).

TABLE 3.—*Standardized Death Rates from Specified Causes per 100,000 Gainfully Occupied Males 15 to 64 Years of Age According to Occupational Classes, 1930*

Occupational Classes	Death Rates per 100,000 Occupied Males									
	All Causes	Diseases of the Heart	Tuberculosis of the Respiratory System	Cancer and Other Malignant Tumors	Pneumonia	Nephritis	Cerebral Hemorrhage and Softening of the Brain	Diabetes Mellitus	Cirrhosis of the Liver	Suicide
All gainfully occupied males in selected occupations.....	909.8	175.3	87.5	81.7	69.3	57.9	42.0	12.1	10.7	35.4
Professional men.....	670.5	177.0	26.2	70.3	38.8	51.4	48.3	10.9	10.8	28.8
Proprietors, managers and officials.....	702.5	184.2	43.2	81.0	53.0	56.2	38.0	16.2	14.4	39.5
Clerks and kindred workers...	775.2	185.5	65.8	77.7	50.5	54.1	36.8	13.5	10.2	34.6
Agricultural workers.....	623.2	95.9	46.5	56.2	43.4	41.3	36.3	9.4	4.3	29.0
Skilled workers and foremen..	828.9	166.0	72.1	85.4	59.7	54.1	38.8	10.9	10.0	28.7
Semiskilled workers.....	1069.3	199.5	102.1	90.8	71.6	59.6	41.4	13.2	10.5	41.9
Unskilled workers.....	1447.7	243.0	184.9	106.6	135.9	83.4	58.3	12.5	17.0	44.1

Source: National Tuberculosis Association, 1934.

Standardized according to age distribution of all gainfully occupied males in ten selected states: Alabama, Connecticut, Illinois, Kansas, Massachusetts, Minnesota, New Jersey, New York, Ohio and Wisconsin.

employing 1,000 or more workers have, on the whole, found themselves in the most advantageous position to organize and maintain reasonably complete medical services. Table 2 demonstrates the overwhelming number of manufacturing establishments which fall below this rank. Roughly, one half of the workers in manufacturing plants are employed in establishments having fewer than 250 persons. Of all manufacturing concerns, 97 per cent are found in this category.

Extending industrial medical service to small plants is a difficult problem. When means are found to provide qualified medical assistance in the control of industrial hazards universally, approximating the character of service now supplied in many large industrial units

Most difficulty is experienced in dissociating the direct effects of daily work on life expectancy from the coincident effects of domestic environment, hereditary influences, general intelligence and other social and economic factors, of which income, housing and nutrition are conspicuous examples. Very likely, many occupations carry no particular health risk at all or the occupational factor in mortality is so small as scarcely to be measurable. Certain employments appear to have positive health advantages, as, for example, agriculture and the professions (table 3). In any event, considerable improvement has occurred in the life expectancy of wage earners during recent years. At least in some disease classifications improvement has proceeded with

greater momentum than in the general population. Contributors to these results have been the safety movement, the improved application of industrial hygiene, the establishment of industrial medical services and the interest which workmen themselves are assuming in health matters.

Mortality statistics do not represent the actual health status of any group, and wage earners are no exception. Yet morbidity data referring to occupations are, on the whole, even more unsatisfactory than death records. Excellent analyses are available with respect to the effect on health of certain specific occupational exposures and the incidence of permanent and temporary disability resulting from industrial accidents. Various studies also have been made on the general incidence of sickness of all types causing absenteeism. The ability to evaluate properly the etiologic relationships of occupation to unhealthy states and to record them promptly and in sufficient detail will constitute one of the major contributions of the medical profession to the industrial health movement.

INDUSTRIAL ACCIDENTS

Injury or death caused by industrial accidents constitutes, for a good share of the medical profession, the only appreciable contact they have had with industrial problems. Accidents rank second among males and fourth in the total population as a cause of death (table 4). Occupational fatalities among white male policyholders of the Metropolitan Life Insurance Company accounted for 20.4 deaths per hundred thousand in 1938. In 1913 the rate reached as high as 45.7. Industrial injury rates follow more or less closely the curves of employment and business activity, but the 50 per cent decline in deaths from industrial injury is, at least in part, the result of concentrated efforts by industry to control the causes and consequences of accidents. Table 5, derived from the Bureau of Labor Statistics, U. S. Department of Labor, is a compilation of the estimated number of disabling injuries occurring in 1938 by industry groups. Certain of these figures are stated to be derived from incomplete and fragmentary sources.

Industrial accidents, as usually defined, are injuries arising out of and in the course of employment. Accident statistics are compiled in terms of frequency and

further classifications are possible—into fatal and non-fatal cases, the latter susceptible of reclassification according to whether the effects of injury are permanent or temporary.

The industrial accident problem has been regarded so long as an economic, industrial and engineering problem

TABLE 5.—Estimated Number of Disabling Injuries During 1938, by Industry Groups

Industry Group	Number of Injuries					
	All Disabilities			Death		
	Total	To employees	To self-employed	Total	To employees	To self-employed
All industries....	1,375,000	1,237,000	138,000	16,400	15,000	1,400
Agriculture.....	267,400	267,400	.....	4,400	4,400	.....
Mining and quarrying.....	82,000	82,000	.....	1,700	1,700	.....
Construction....	202,200	270,000	21,300	2,600	2,400	200
Manufacturing...	220,800	214,200	6,600	1,900	1,700	200
Public utilities...	16,300	16,300	.....	500	500	.....
Trade: wholesale and retail.....	201,500	157,000	43,900	1,800	1,400	400
Railroads.....	30,300	30,300	.....	600	600	.....
Misc. transportation.....	52,000	33,100	19,800	700	500	200
Services and misc. industries..	212,200	165,200	47,000	2,200	1,800	400
Industry Group	Permanent Disabilities			Temporary Disabilities		
	Total	To employees	To self-employed	Total	To employees	To self-employed
All industries....	98,900	85,200	13,700	1,260,300	1,136,000	123,500
Agriculture.....	13,000	13,000	.....	250,000	250,000	.....
Mining and quarrying.....	2,500	2,500	.....	77,800	77,800	.....
Construction....	14,600	13,500	1,100	275,000	255,000	20,000
Manufacturing...	14,000	13,000	1,000	204,000	199,500	5,400
Public utilities...	700	700	.....	15,100	15,100	.....
Trade: wholesale and retail.....	39,700	31,200	8,500	160,000	125,000	35,000
Railroads.....	1,500	1,500	.....	28,200	28,200	.....
Misc. transportation.....	1,000	600	400	51,200	32,000	19,200
Services and misc. industries.....	11,000	9,200	2,700	108,100	154,200	43,900

Source: Bureau of Labor Statistics, United States Department of Labor.

TABLE 4.—Rank of Accidents as the Cause of Death
Death rates per 100,000 population.

Total Population	Males	Females
Heart disease.....265.0	Heart disease.....304.3	Heart disease.....230.8
Cancer.....112.0	Accidents .....114.4	Cancer.....121.5
Pneumonia..... 55.1	Cancer.....105.0	Cerebral hemorrhage..... 78.4
Accidents 81.4	Pneumonia..... 97.2	Chronic nephritis. 74.7
Chronic nephritis. 79.6	Chronic nephritis. 84.4	Pneumonia..... 72.7
Cerebral hemorrhage..... 77.0	Cerebral hemorrhage..... 75.7	Accidents 47.6
Tuberculosis..... 53.6	Tuberculosis..... 60.6	Tuberculosis..... 46.3

Accident facts, 1939. National Safety Council, 1939. U. S. Census Bureau data, 1937.

severity. Frequency rates are an expression of the number of accidents per million man hours of work exposure. Much effort has been expended in developing uniform methods of reporting, but data from various sources must be examined critically because of variations in scope, definition of accident, and the method of accident exposure calculation. Severity rates are compiled on the basis of the extent of the resulting incapacity expressed in days of lost time per thousand man hours of work. From the point of view of severity,

that its medical aspects have been to a considerable degree overlooked. The associated factors can be understood best through examining two major aspects—prevention and individual medical management. Prevention deserves first consideration and, in most instances, has received it. Such tactics appeal to industrialists as businesslike, since reduced accidents result in reduced compensation insurance premiums. Out of this interest have grown the safety movement and the professional approaches represented by safety and industrial hygiene engineers. As developed in this country, the major functions of prevention of industrial accidents have grouped themselves into subdivisions representing research, engineering, safety education and medical control.

Research includes the study of reports and the analysis of all available statistics regarding the causes and consequences of accidents. Sources of information are industrial commissions, state departments of labor and insurance companies, all of which compile valuable analyses of accident experience and causation. The Bureau of Labor Statistics of the U. S. Department of Labor and the National Safety Council are the most important agencies gathering and correlating raw industrial accident data.

The engineering aspect of accident prevention refers to the control of mechanical factors, either those which cause accidents or those introduced to reduce hazards. Through such methods sound safety practices are established and safety codes formulated which ultimately constitute a basis for safety legislation.

Education relates to general propaganda as well as individual and group instruction in the avoidance of accidents. Safety contests, meetings, posters and similar functions are important parts of such programs.

Medical industrial accident control consists of physical examination of workers, both prior to employment and periodically during the course of employment. When properly conducted, such examinations promote safe placement of applicants for work and maintain regular employees in positions geared to mental and physical capacity. Minor physical defects are not necessarily significant in industrial physical supervision and should not carry too much weight in the total evaluation of the individual. Gross physical defects should be given the importance they deserve. Much emphasis is currently attached to the study of the worker from the point of view of accident proneness. These investigations involve appraisal of the psychomotor apparatus and personality types in order that placement may occur in work consistent with least risk and greatest aptitude. The rapid growth in the use of automatic machinery is a case in point, altering the role of the worker from that of a machine operator to that of a machine tender. Changes of this character may bring about severe alterations in the attitude of the worker to his job. A much higher degree of selection among personality types is therefore involved in order to prevent monotony, fatigue and dissatisfaction. Furthermore, laxness in concentration on the industrial operation is a prolific cause of accidents and is directly related to such social and economic conditions as income, housing and nutrition. All together, there are a wide variety of factors which are considered to have greater or lesser effect on accident occurrence which need to be understood by physicians, such as age, length of time on the job, time of day, character of ventilation, illumination, and other considerations which may be personal to the worker or affecting groups of workers.

The second important aspect of the industrial accident problem refers to competent medical care of the injured worker. This implies suitable medical organization for control of accidents and immediate treatment. Control and treatment are accomplished through first aid, nursing, part or full time physicians and arrangements for hospitalization. The value of treatment will be determined by the qualifications of the physician not solely from a surgical point of view but according to his intimate knowledge of the total industrial problem. An ideal result for all concerned would be full restoration of the injured workman to his former earning capacity in the same line of work and with minimum loss of time. Approximations to this standard will constitute the measure of successful medical management, which must be sympathetic and tactful enough to instill a desire to get well and return to work. The medical and legal responsibilities relating to the determination of temporary and permanent disability and the completion and prompt filing of forms and blanks for industrial commissions and insurance companies must be accepted as an obligation as well as a field for some necessary reform.

OCCUPATIONAL DISEASES

Occupational diseases, troublesome as they are to certain industries, are for industry as a whole the least important cause of lost time disability (table 6). Reliable statistics about the incidence of occupational diseases are scarce and, to complicate the picture still more, not much is known about the chronic or subacute effects of long continued exposure to low concentrations of toxic industrial materials. Even to define occupational diseases has proved difficult, as the language used in the

TABLE 6.—*Absenteeism from Illness and Injury in Industry*
Days lost per employee per year among 352,591 workers.

Cause of Lost Time	Days Lost
Occupational disease	0.61
Industrial injury	0.57
Nonindustrial injury and illness.....	8.85

Source: American College of Surgeons.

statute relating to occupational disease in Illinois described elsewhere in this issue amply illustrates.

To facilitate understanding, attempts have been made to classify occupational diseases. Bulletin 582 of the Bureau of Labor Statistics, U. S. Department of Labor, contains such a classification prepared by Dublin and Vane under the following headings:

- A. Abnormalities of temperature and humidity.
 1. Extreme dry heat.
 2. Heat and humidity.
 3. Sudden variations of temperature.
- B. Compressed air.
- C. Dampness.
- D. Defective illumination.
- E. Dust.
 1. Inorganic dust.
 2. Organic dust.
- F. Infections.
 1. Anthrax.
 2. Hookworm.
 3. Septic infections.
- G. Radiant energy.
 1. X-rays, radium and other radioactive substances.
 2. Ultraviolet and infra-red rays.
- H. Repeated motion, pressure, shock.
- J. Poisons.

These headings provide some insight into the general nature and causes of occupational diseases, all of which will be subjects for more extensive treatment in subsequent publications by the Council.

Occupational disease reporting needs particular emphasis. No disease can be controlled unless its nature and extent can be ascertained with reasonable accuracy. Some states, therefore, have attempted to secure such information by making occupational diseases reportable by physicians. The value of such reports is obvious, but results have been negligible because physicians frequently fail to recognize occupation as an etiologic factor in disease. The limited notations about occupation on death certificates constitute the only evidence possessed by many state health departments regarding the occurrence and effects on health of industrial exposures.

A number of states have enacted workmen's compensation laws covering occupational diseases. Some have schedules specifying the occupational diseases which come within the scope of the statutes. Certain

jurisdictions compensate for occupational diseases under all inclusive acts often referred to as blanket coverage. Included in these classifications are the principal industrial states in this country. Since adequate information based on the reporting of occupational diseases by physicians is largely nonexistent, an index to their prevalence has been sought in the number of these diseases which have been compensated, especially in the predominantly industrial states. Accurate as the reports of compensation boards are in other respects, data on occupational disease are fragmentary and difficult to assess. Diseases listed in a schedule adopted by a state and actual diseases reported by the industrial commission as compensated may bear no close relationship. Even when statistics are carefully kept, the use of inclusive terms makes detailed information difficult to secure. Silicosis and asbestosis may be included under the term "tuberculosis—all forms" and acute industrial poisoning may be lumped under the heading "poisonous and corrosive substances." Present evidence, however, indicates that occupational disease claims of all types are increasing in number and in cost. Industrial dermatitis is far and away the most prevalent cause, approaching 70 per cent of closed claims in some areas. Good conclusions about other aspects of occupational disease must await the adoption of standardized reporting according to terminology which renders them identifiable in all states, no matter what methods are employed for extending compensation coverage.

ORDINARY ILLNESS IN INDUSTRY

Industrial accidents and occupational diseases have received most attention from industrial physicians and hygienists. They are associated with work as proximate cause, a relationship which has been recognized in workmen's compensation practice. It has been, therefore, to the advantage of industrialists first to seek out means for reducing the frequency and severity of work related disability. Yet in industry accidents and occupational diseases account for a very small proportion of all time lost by workers to disabling injury or sickness. Data shown in table 6, derived from studies conducted by the American College of Surgeons, illustrate the much greater probability of lost time from ordinary illness than from accident or disease arising out of work. These and other data indicate that male workers lose nearly nine days annually to disabling sickness or injury, and in every thousand male workers every year nearly one hundred absences of seven days or longer will occur. As a rule there will be more sickness among women employees, both as to frequency and extent, and more among married than single women. The principal causes of lost time in industry for men and women both are the diseases and complaints which make up the bulk of general practice everywhere. This is, in the main, true regarding absences of longer or shorter duration. Economically, losses in wages and through disruptions in production schedules must be estimated in billions of dollars each year.

Although not responsible for ordinary sickness and injury, there are excellent incentives for industry to analyze uniformly and regularly all lost time by employees, no matter what the cause, duration or end result. Such information is the best available guide to the need for specific health activity in industry and the directions it should take. The merits of this type of approach have been amply demonstrated to industry by the published analyses of morbidity and mortality data

by public health and other agencies. Uniform methods of recording work absence will assist greatly toward clarifying relationships between physical and mental capacity or defect as revealed by physical supervision and lost time. Only fragmentary data are available which correlate these factors with occupation, skill and experience as well as age, sex, color, marital status, duration of illness and other factors needed for straight or comparative statistical purposes. Likewise, the beneficial aspects of controlled and accurately recorded observations about the health of employed groups obviously cannot be restricted to industry or the industrial employee alone. They can hardly fail of providing much better understanding of community health problems as a whole.

When causes of lost time are considered, a good share of the medical problems of industrial health fall clearly in the province of private medical practice. The extension of preventive medical methods in order to reduce all loss of time, absenteeism and short work spans is one of the objectives of industrial health. Results will be accomplished best if public health workers in industry and in the government recognize the contributions which private physicians in general and special practice can and ought to make towards more adequate health control over workers in both large and small industry. The interests of the worker are best served if the interdependence of all elements in the profession is accepted as a proper foundation for the development of a well balanced industrial health program.

THE PHYSICIAN IN INDUSTRY

The simplest way to classify physicians practicing in industry is in relation to the time they devote to it—full time, part time or on call. Much confusion has occurred in professional minds from a failure clearly to distinguish the objectives of these groups. In a strict sense the full time industrial physician represents in the whole field of medicine that segment of special interest which applies the theory and practice of medicine to the health of employed groups. As such the work they do is set apart from the individual case work of the private practitioner whose contribution to industrial health mainly restricts itself to curative and reconstructive phases of occupational injuries and diseases. Even under this limited type of service it is estimated that private physicians engaged in general or specialty prac-

TABLE 7.—Increase in Industrial Practitioners

	1934	1936	1938
Limiting practice.....	232	269	345
Giving special attention.....	879	990	1,054

American Medical Directory.

tice supply more than four fifths of the medical service which industry is obliged to give or which it provides in an enlightened view of the effects of unhealthful exposure on employees and hence on production.

The record of growing interest in industrial medical services and the increasing recognition of the usefulness of such a career are shown in the accompanying table drawn from the American Medical Directory. These tabulations demonstrate substantial increases during the last few years in the number of physicians limiting or giving special attention to industrial practice.

According to Selby, industrial medicine as practiced by competent and ethical physicians who devote all or

a major share of their activities to it attempts to furnish employees with the best possible health protection consistent with:

1. The purpose of industry.
2. The employer's responsibility as fixed by law for competent care and prevention of occupational injury and disease.
3. The employee's right to free choice of medical counsel in all health matters not occupational in origin.

The relationships which ordinarily need most clarification as between physicians in industry and private practitioners refer to three principal lines of activity—industrial hygiene, physical supervision and therapy.

INDUSTRIAL HYGIENE

It has been quite generally felt that the physician in industry fulfils his function best if he regards himself, over and above statutory requirements, as health officer of the plant responsible for plant hygiene. His special

TABLE 8.—*Medical Services Supplied in Industrial Establishments Classified According to Size of Plant*

Total plants reporting, 611 Total employees covered, 1,120,062

	1,000 and Over		500 to 1,000		100 to 500		Under 100	
	Num-ber	%	Num-ber	%	Num-ber	%	Num-ber	%
Establishments.....	196	32.0	98	16.0	200	32.7	117	19.1
Employees covered.....	1,031,763	89.3	63,982	5.8	48,857	4.4	5,460	0.5
Full-time physicians.....	93	47.4	21	21.4	37	18.5	0	0
Full-time nurses.....	166	84.7	51	52.0	39	19.5	3	2.6
Part-time nurses.....	7	3.6	15	15.3	15	7.5	6	5.1
No nurses.....	23	11.7	32	32.7	146	73.0	108	92.3
First aid.....	199	96.9	93	94.9	186	93.0	94	80.3
Workmen's compensation.....	186	94.9	91	92.9	180	90.0	93	84.6
Pre-employment examinations.....	186	94.9	84	85.7	137	68.5	54	46.2
Periodic examinations.....	140	71.4	51	52.0	85	42.5	27	23.1
Accident and disease prevention.....	167	85.2	76	77.6	124	62.0	49	41.9
Plant sanitation.....	153	78.1	56	57.1	88	44.0	27	23.1
Health education.....	129	65.8	42	42.9	59	29.5	11	9.4
Medical advisory service.....	150	76.5	56	57.1	109	54.5	33	28.2
Clinical laboratory *.....	107	54.6	36	36.7	79	39.5	35	29.9
X-ray *.....	107	54.6	38	38.8	83	41.5	50	42.7
Physiotherapy *.....	108	55.1	43	43.9	61	30.5	27	23.1
Dental service.....	35	17.9	4	4.1	8	4.0	1	0.9

* In the plant or readily available.

understanding of the control of industrial exposures constitutes the professional equipment which distinguishes his activity from ordinary private practice and from conventional preventive medicine as well. He advises and assists employers to protect workmen against physical impairment arising out of occupational environment. His success is measured according to his familiarity with toxic agents and harmful processes, the adequacy of protective devices and their suitable maintenance, and particularly the persistence with which he pursues practical solutions of these problems. Activities such as these are in the best tradition of preventive medicine and do not involve competitive relationships with private practice. Nevertheless, the medical profession has certain very definite opportunities and responsibilities toward furthering and upholding standards of industrial hygiene.

Employers of all grades will become more generally aware of the importance of industrial hygiene as values are demonstrated through practical application by fellow employers, through the impetus provided by the workmen's compensation statutes and through the urgings of the industrial organizations and trade asso-

ciations themselves. Once an employer develops an interest in controlling plant hygiene problems, he is likely to turn first to the physician who takes care of his industrial injuries. If this source fails him, as it frequently does, helpful assistance may be obtained only with great difficulty. Every physician has on this basis then an opportunity for constructive preventive medical achievement which no amount of personal distaste ought to impel him to ignore. It is the function of medical organization and education to prepare private physicians either to give reliable advice directly about industrial health service or to acquaint him with sources of authoritative information.

PHYSICAL SUPERVISION

Effective as industrial hygiene has proved to be, other useful practices have come to be included as functions of industrial medical service. Alleged aggravation, by the nature of the work, of preexisting and coexisting diseases not in themselves occupational in origin has necessitated physical examination of applicants for work. Properly, these are conducted at the time of employment to assure safe placement and often enough thereafter to assure protection against diseases originating in or unfavorably influenced by occupation, and for diagnosis to establish the occupational or nonoccupational origin of disability.

In respect to physical supervision, two major considerations present themselves as factors affecting relationships of private physicians to industry. In increasing numbers of plants they are likely to be called on to undertake physical examinations of workers which, aside from certain medicolegal considerations, they ought to be competent to perform provided they supply the service with as much impartiality as it is possible to assume. The usefulness of this service will be greatly increased if physicians have good knowledge of the working conditions, materials and processes to which examinees are exposed.

Of far greater importance to private physicians are the enormous number of physical defects which are uncovered by industrial physical examinations. Correction of these defects is a function not of industry but of private practice. Efforts which the physician in industry, full or part time, can undertake in bringing together family physicians and the workers needing medical care have such beneficial aspects to all concerned as hardly to warrant argument. Deviations from this principle on the part of physicians in industry who have used industrial connections as an unfair competitive device in the development of private practice constitute the major reasons why industrial medicine has suffered severely in the eyes of the general medical profession.

THERAPY

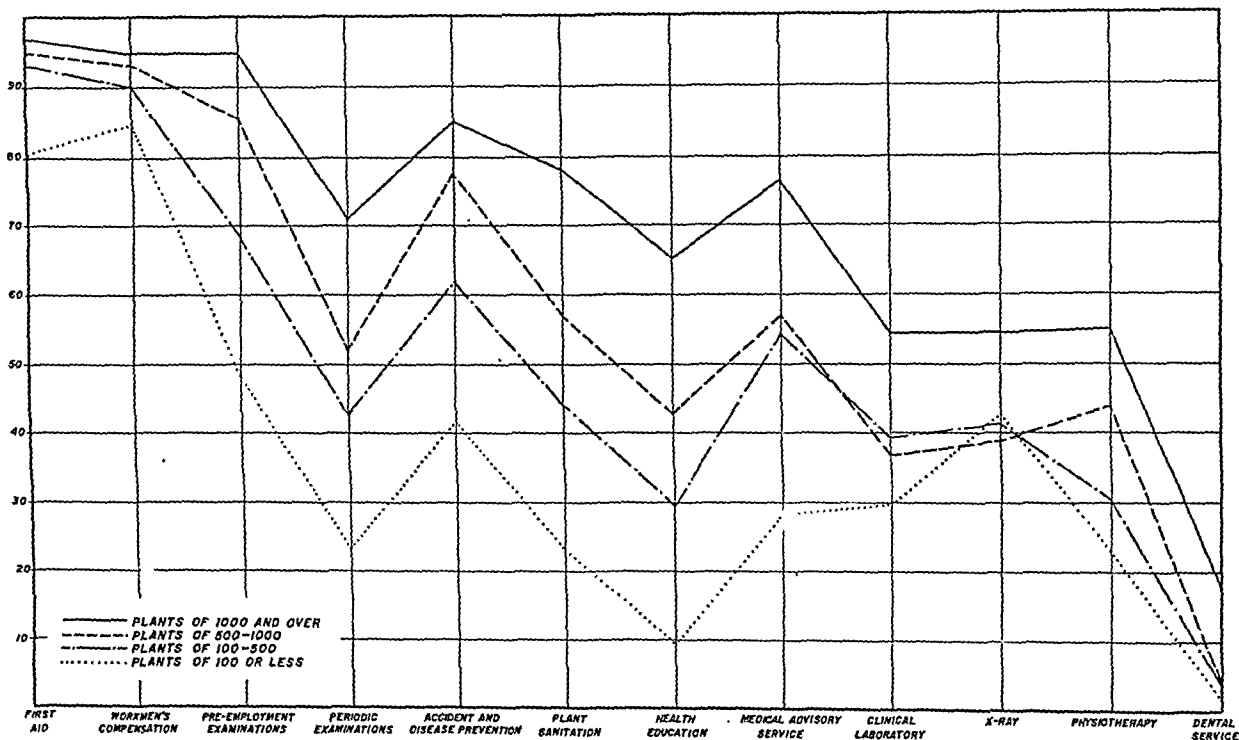
Workmen's compensation acts have obliged employers to furnish treatment. In a great many instances medical services in industry grew out of this obligation. As a rule there is little disposition by employers to assume any responsibility for treatment beyond this point. The variable elements of friction which have existed between the industrial physician and the private practitioner in respect to freedom of choice of medical counsel for the care of not only ordinary sickness but industrial disability are much more likely to diminish than otherwise. The full time industrial physician, if present trends prevail, will be less and less a therapist and more and more an administrator of public health

through the application of industrial hygiene. In that capacity he should assume a public health function and act as a case finder for the private physician and specialist, through whom the direct remedial service should be applied. He should act as an active participant in the rehabilitation of injured workers through selection of suitable occupational therapy in the sense of restoration to earning capacity under conditions of controlled work. With these exceptions and the attention to minor injuries or ailments for which the worker consults the plant physician largely because he is accessible and no lost time is involved, therapy is likely to be a diminishing segment of the industrial medical officer's activity. This trend of industrial medicine to ally itself with private practice in the care of industrial patients needs to be widely extended. Much will depend

8. Impartial health appraisals of all workers.
9. Provision of rehabilitation services within industry.
10. The conduct of a beneficial health education program.

An attempt has been made by the Council on Industrial Health to determine the frequency with which these services are provided by industrial physicians in plants of varying sizes and types. Requests were first addressed to secretaries of state and county medical societies for as complete lists as possible of all physicians engaged full or part time in industrial practice. By this means a total of 2,544 names was secured. To every other one of these names, arranged alphabetically according to states, a questionnaire was directed. No two physicians were employed in the same plant. Four hundred and twenty-five tabulatable replies were

COMPARISON OF MEDICAL SERVICES SUPPLIED BY PLANTS OF VARYING SIZES.



on the private physician's capacity to care for compensable disability competently and with the least possible loss of working time. Incompetent, dilatory or dishonest practices in this field are not only thoroughly unprofessional but are, in the industrial field, private practice's most active competitor.

FUNCTIONS OF MEDICAL SERVICE IN INDUSTRY

The functions of medical service in industry, then, can be listed as:

1. Regular appraisal of plant sanitation.
2. Periodic inspection for occupational disease hazards.
3. Adoption and maintenance of adequate control measures.
4. Provision of first aid and emergency services.
5. Prompt and early treatment for all illnesses resulting from occupational exposure.
6. Reference to the family physician of individuals with conditions needing attention, cooperating with the patient and his physician in every practical way to remedy the condition.
7. Uniform recording of absenteeism due to all types of disability.

received containing data supplied by the physicians responsible for health control in 611 individual establishments and for 1,120,062 employees.

Table 8 classifies services supplied by industrial physicians according to size of plant and demonstrates in adjoining columns the ability of plants of varying capacity to support the principal components of industrial medical services. The distribution of industrial plants according to size in the sample is shown in the table. Of the 1,120,062 employees covered, nearly 90 per cent were found to be in the largest units. All plants had at least part time medical service. Full time physicians were reported in 47 per cent of the plants employing more than 1,000 workers and in none of those employing fewer than 100. The data regarding full time nursing service show a similar diminution from the large to the small plants, almost fading out entirely in the establishments employing under 100 men. In this group 92 per cent of the plants had no nursing services at all.

First aid services and the care of compensation cases are quite uniformly supplied in plants of all sizes because of legal requirements existing in most of the states. In all other respects the smaller the plant the greater does it appear at a disadvantage in the supplying of industrial medical service. The more complete provision of preventive medical service in large plants is reflected in such activities as preemployment and periodic examinations, accident and disease prevention, plant sanitation, health education and medical advisory services. The latter refers particularly to advice supplied about physical defects not occupational in origin and testifies in a great many cases to cooperative relationships which are developing between industrial medical services and the workers' family physicians. In plants of all sizes physical examination of applicants for work is observed to a much higher degree than subsequent periodic surveys. X-ray and clinical laboratories are said to be located in the plants or "readily

TABLE 9.—Medical Services Supplied in Industrial Establishments Classified According to Type of Industry
Total plants reporting, 611 Total employees covered, 1,120,062

	Farming, Forestry, Fishing	Mining	Manufacturing and Mechanical	Transportation and Communication	Trade	Public Service	Domestic, Personal Service
Establishments.....	7	96	404	56	47	7	6
Full-time physicians.....	1	52	93	9	9	2	1
Full-time nurses.....	1	30	182	16	17	3	2
Part-time nurses.....	0	7	23	4	3	0	1
No nurses.....	6	59	199	36	27	4	3
First aid.....	6	90	372	51	43	7	5
Workmen's compensation.....	7	90	371	50	40	6	4
Pre-employment examinations..	3	72	305	46	31	3	3
Periodic examinations.....	1	40	300	36	20	3	2
Accident and disease prevention	3	64	275	36	29	4	2
Plant sanitation.....	1	43	230	22	21	4	2
Health education.....	1	29	162	21	16	4	0
Medical advisory service.....	3	65	206	28	25	5	3
Clinical laboratory *	2	66	138	27	12	2	1
X-ray *	1	73	151	36	17	3	2
Physiotherapy *	1	46	145	29	15	1	2
Dental service.....	0	7	24	9	5	2	0

* In the plant or readily available.

available," in a substantial proportion of establishments in all classifications, a reflection of the need for precise information about the physical condition of applicants and, less regularly, for other employees, unless they are exposed to harmful materials and processes. The extent to which consulting radiologists and clinical pathologists are used is not known, but presumably in ordinary cases their services will not be called for. The question of standardized technic and the competence of interpretation of radiologic and pathologic examinations in industry needs additional investigation. The provision of physical therapy equipment in these plants is appreciable in all categories, presumably to facilitate follow-up care of industrial injuries where this type of restorative treatment can be applied with the smallest amount of lost time. Diagnostic dental service, on the other hand, is largely underdeveloped in industry, although correctable dental defects are the most frequent conditions found in industrial physical examinations. Other consulting services most frequently mentioned are those supplied by ophthalmologists and dermatologists.

The nature of the industry in which these medical services are organized is shown in table 9. The pre-

dominance of manufacturing and mechanical industries in the tabulation is a natural one indicative of the predominance of harmful industrial exposures in occupations falling in this group. Mines are well represented in all the medical service brackets and, to a somewhat less extent, transportation and communication. Most of the examples of extended medical service mentioned in the replies to the questionnaire were reported from these groups. In most of the other categories, figures are too small to have much significance.

Industrial health services according to this evidence have proved to be most advantageously developed in large plants. In all classifications according to size, however, there are any number of opportunities for useful medical activity in a relatively unexplored field. Many of the small plants which have comparatively unsatisfactory accident and occupational disease experience will look to the medical profession for guidance and assistance. Such demands ought to be anticipated through education applied to physicians everywhere. There is a definite place for the physician in every industrial plant, large or small. Until industry and labor are taught to recognize that place and to realize the value of intelligent health conservation, the full potentialities of industrial health as a contributor to community and national welfare will not be realized.

INDUSTRIAL HEALTH ACTIVITIES IN ORGANIZED MEDICINE

All of the official agencies in organized medicine have exerted direct or indirect influences on the standards and procedures of industrial medical practice. One of the useful functions of the Council on Industrial Health will be to coordinate these activities as well as to point out to physicians the functions of extraprofessional groups and associations which take an interest in the health of the worker.

The growing interest in industrial health is demonstrated by the increased space assigned in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION directly to items indexed under the titles of industrial medicine and workmen's compensation, jumping from thirty-eight references in 1920 to 164 in 1938. This subject matter refers to original articles, editorials, queries and minor notes and abstracts and has no reference to the large amount of additional information in THE JOURNAL directly applicable to improved industrial medical standards. Other agencies in organized medicine have made valuable contributions to professional understanding of social and medical values in industrial health. Workmen's compensation legislation has periodically been surveyed, beginning with the investigation by the Judicial Council in 1915 and since by that agency as well as by the Bureau of Medical Economics. Since its creation, the Bureau of Legal Medicine and Legislation has kept closely in touch with the developments in the field of workmen's compensation legislation. It has advised state associations with respect to such legislation, urging, among other things, that injured employees be given the right to choose the physicians who treat their injuries, and has exerted its influence to the end that only scientific medical care be made available to injured workmen. The Bureau has also followed the trend of judicial decisions relating to workmen's compensation and abstracts the more important decisions for publication in the medicolegal columns of THE JOURNAL. A Committee on Industrial Sanitation was appointed in 1915 by the Section on Preventive

Medicine and Public Health, which reported in the following year that the great mass of workmen had been denied the opportunity of enjoying healthful living and working and predicted a large field of opportunity open to the physician in the industrial field. The scope of activity which physicians could profitably engage in was outlined by this committee and includes substantially all the functions now considered applicable to present day industrial medicine. Discussions of industrial medical problems have been so continuously presented in that section since that industrial medicine shortly came to be included in its title. The Bureau of Health Education has furthered the cause of physical examination in industry through the development of health examination forms and a physical examination manual. The Council on Physical Therapy has engaged in investigations of resuscitation equipment, artificial limbs and estimations of disability from hearing loss, following to some degree the fundamental work of the Section on Ophthalmology relating to disability from visual loss. Other councils and bureaus have exerted a less direct but important influence in industrial medical standards. The ethical code takes on real significance when applied to medical service for industrial wage earners. The condemnation of quackery and cultism benefits industry as well as the general population. Industrial medicine benefits by every improvement in undergraduate teaching, postgraduate medical instruction, adequate standards of hospital training, licensure and specialist certification. All these activities represent contributions by organized medicine to improve medical care for the whole population and visualize, therefore, in no small degree, that the industrial worker will be one of the principal beneficiaries.

Activities in State and County Medical Associations.
—Early in the development of the Council on Industrial Health a policy was adopted regarding its relationship to state and county medical societies in the following terms:

Contact should be made with the several state medical societies, urging them to create committees on industrial health which will proceed at once to study the problems in this field in their respective communities. The organization of committees should be extended as far as practicable to the county medical societies. These committees should be urged to investigate the present activities within their states of the several agencies interested in industrial health, as well as the proposals for industrial legislation which are being presented to various legislatures. Educational programs should also be sponsored under the auspices of these committees.

Early investigation showed that, while a fair percentage of the states had formed committees dealing with certain aspects of industrial health, centralization of responsibility was largely absent and functions, were in many instances distributed through several committees, such as public policy and legislation, economics, contract practice and workmen's compensation, all of whom might act independently on economic, ethical or clinical matters relating to industrial health.

The evident need for coordination of activities under a definite program has appealed to a majority of the state medical associations. At the present time thirty-four of the state medical associations have formed committees on industrial health or indicated existing committees through which the Council can act in its efforts to clarify the objectives of industrial health and to elevate its standards. The committees and chairman of each are listed in table 10.

A program of activities for these committees has been formulated with the following objectives:

1. Train physicians to recognize and report occupational disease.
2. Train industry and labor to the value of industrial health conservation.
3. Elevate medical relations and standards under workmen's compensation.
4. Scrutinize all social legislation affecting industrial health.
5. Clarify relationships between industrial and private practitioners.
6. Improve relations between physicians and insurance.
7. Establish working relationships with all state agencies interested in industrial health.

TABLE 10.—Committees on Industrial Health in State Medical Association

State	Committee	Chairman
Arizona.....	Industrial Relations Committee	Dr. Robert Kennedy
California.....	Committee on Industrial Practice	Dr. Donald Cass
Colorado.....	Committee on Industrial Health	Dr. S. B. Potter
Connecticut.....	Committee on Industrial Health	Dr. Clifford Kuh
D. C.....	Committee on Industrial Medicine	Dr. Edgar McPeak
Florida.....	Committee on Representatives to Industrial Council	Dr. A. H. Welland
Georgia.....	Committee on Industrial Relations	Dr. C. F. Holton
Idaho.....	Committee on Industrial Medicine	Dr. E. N. Roberts
Illinois.....	Occupational Disease Committee	Dr. P. H. Kreuscher
Indiana.....	Committee on Occupational Diseases	Dr. C. V. Rozelle
Iowa.....	Committee on Industrial Health	Dr. E. J. Harnagel
Louisiana.....	Committee on Industrial Health	Dr. S. O. Lyons
Maryland.....	Committee on Industrial Health	Dr. Raymond Hussey
Massachusetts..	Committee on Industrial Health	Dr. W. Irving Clark
Michigan.....	Committee on Occupational Disease and Industrial Hygiene	Dr. Henry Cook
Minnesota.....	Committee on Industrial Hygiene and Occupational Diseases	D. J. L. McLeod
Missouri.....	Committee on Industrial Health	Dr. E. C. Funsch
Montana.....	Committee on Industrial Hygiene	Dr. L. T. Sussex
Nevada.....	Committee on Industrial Health	Dr. R. A. Bowdle
New Jersey.....	Committee on Industrial Health and Hygiene	Dr. J. I. Fort
New York.....	Committee on Industrial Dermatoses	Dr. E. F. Traub
North Carolina..	Committee on Industrial Health	Dr. H. F. Easom
Ohio.....	Committee on Workmen's Compensation	Dr. D. B. Lowe
Oklahoma.....	Committee on Industrial Service and Traumatic Surgery	Dr. O. S. Somerville
Oregon.....	Committee on State Industrial Affairs	.....
Pennsylvania...	Committee on Industrial Health	Dr. C.-F. Long
Rhode Island...	Committee on Industrial Health	Dr. Charles Gormley
South Dakota...	Committee on Industrial Health	Dr. R. W. Mullen
Tennessee.....	Committee on Industrial Hygiene	Dr. C. E. Newell
Texas.....	Committee on Industrial Health	Dr. Ross Trigg
Utah.....	Committee on Industrial Health and Hygiene	Dr. J. P. Kerby
Virginia.....	Committee on Industrial Health	Dr. F. J. Wampler
Washington....	Committee on Industrial Health	Dr. H. T. Buckner
Wisconsin.....	Committee on Industrial Health	Dr. S. J. Seeger

Feeling that some effective means of interchange of ideas between the Council and the state committees other than correspondence would enhance organization, provide uniformity of action and stimulate wider initiative, a bulletin has been developed through which it is hoped objectives will be more rapidly realized.

Already certain county medical societies are beginning to organize committees of their own to provide for proper medical leadership in respect to health measures designed for employed groups. These developments are of first importance, since it is in the county medical society that problems of industrial health are encountered earliest and where they are most directly dealt with. The functions of investigation, correlation and education which characterize the programs of the Council on Industrial Health and of the committees on

industrial health in the state medical associations are susceptible of extension into county units. Although no fixed formula can be established for county society activities because of the wide variety of local conditions, it is felt that the three classifications of activity that have been mentioned are flexible enough for general need and yet provide a basis for reasonable uniformity and consistency.

INDUSTRIAL HEALTH IN THE GOVERNMENT

As in the case of private medical practice, the scope and administrative procedures in workmen's compensation have determined the extent and characteristics of activities by governmental agencies directed at industrial health problems. Under forms of compensation benefits restricted to industrial accidents only, principal reliance came to be placed on state departments of labor or industrial commissions who created factory inspection

Industrial hygiene activity in state governments has been greatly expanded recently by assistance available under the Social Security Act of 1935. Under the guidance of the United States Public Health Service this work has developed in three principal directions:

1. Administrative functions concerned with coordinating all activity undertaken by federal, state and unofficial agencies.
2. The extension of industrial hygiene units in state and local health departments.
3. Studies and investigations carried on by the laboratory and field sections of the Division of Industrial Hygiene.

All these activities are carried out cooperatively with health departments, with industry, with physicians and with other organizations. The accompanying table lists the industrial hygiene bureaus now incorporated in state governments. Two are assigned to state departments of labor in New York and Massachusetts. In addition

TABLE 11.—Industrial Hygiene Bureaus in State Governments

State	Department Responsible	Department Head	Personnel				Preliminary Hygiene Surveys			Date of Establishment
			Medical	Engineers	Technical	Clerical	Completed	Published	In Progress	
Alabama.....	Health	J. R. Cain, M.D.....	1	0	0	0	..	..	*	1937
California.....	Health	J. P. Russell, M.D.....	1	2	1	2	..	..	*	1937
Connecticut.....	Health	A. O. Gray, M.D.....	1	2	2	2	..	..	..	1923
Idaho.....	Health	A. F. Galloway, M.D.....	..	..	..	..	..	*	..	(1)
Illinois.....	Health	M. H. Kronenberg, M.D.....	3	2	4	2	..	*	..	1936
Indiana.....	Health	L. W. Spolyar, M.D.....	1	1	0	1	..	*	..	1935
Iowa.....	Health	A. H. Wieters.....	0	1	1	1	*	..	..	1937
Kansas.....	Health	E. Boyce.....	0	1	1	1	*	..	..	1937
Maryland.....	Health	J. M. McDonald, M.D.....	1	2	3	2	..	*	..	1936
Massachusetts.....	Labor	M. Bowditch.....	0	1	2	2	..	..	..	1934
Michigan.....	Health	K. E. Markuson, M.D.....	2	5	0	3	*	..	..	1935
Minnesota.....	Health	A. E. Chesley, M.D.....	..	..	..	..	..	..	..	(1)
Mississippi.....	Health	J. W. Duggar, M.D.....	1	0	1	1	..	..	..	1929
Missouri.....	Health	W. S. Johnson.....	0	3	0	1	..	..	..	1936
Montana.....	Health	W. F. Cogswell, M.D.....	..	..	..	..	..	..	..	(1)
New Hampshire.....	Health	F. J. Vintinner.....	0	1	0	1	..	*	..	1935
New York.....	Labor	L. Greenburg, M.D.....	7	7	12	7	..	..	..	1913
North Carolina.....	Health	T. F. Vestal, M.D.....	2	2	1	1	..	..	..	1935
Ohio.....	Health	K. D. Smith, M.D.....	3	1	2	2	..	*	..	1913
Pennsylvania.....	Health	W. B. Fulton, M.D.....	2	8	0	3	..	..	..	1936
Rhode Island.....	Health	C. L. Pool.....	1	2	2	1	*	..	..	1926
South Carolina.....	Health	H. F. Wilson, M.D.....	1	1	0	1	..	*	..	....
Tennessee.....	Health	Crit Pharris, M.D.....	1	1	0	0	..	..	*	1937
Texas.....	Health	C. A. Nau, M.D.....	1	2	1	1	..	*	..	1936
Utah.....	Health	J. L. Jones, M.D.....	1	0	0	0	..	*	..	....
Vermont.....	Health	H. W. Slocum.....	1	1	0	1	..	..	..	1936
Virginia.....	Health	R. T. Homewood.....	0	1	1	1	..	*	..	1937
West Virginia.....	Health	A. McClue, M.D.....	1	2	1	1	..	..	..	1936
Wisconsin.....	Health	Paul Brehm, M.D.....	1	2	1	1	..	..	..	1937

(1) Personnel now being established.

tion services and issued regulations under factory acts designed to suppress unsafe practices and working conditions. As workmen's compensation widens and extends coverage to occupational diseases, the desirability for establishing more adequate forms of governmental control has begun to exert itself.

Exceptions to this general statement in the federal government are the United States Bureau of Mines and the United States Public Health Service, which separately and jointly have engaged in valuable industrial health activity for more than a quarter of a century. The United States Public Health Service, through its Division of Industrial Hygiene in the National Institute of Health, has contributed greatly to administrative standards of industrial hygiene through its program of research, education and cooperative services. The Division of Labor Standards in the United States Department of Labor was established in 1934. It is designed to formulate codes of safe procedure under model laws which the individual states may adopt. One of its most valuable contributions has been the establishment of regional training schools for factory inspectors.

to those listed, bureaus have been developed in a number of city and county health departments. Essentially, however, the functions of bureaus of industrial hygiene are identical and include:

1. Consultation with plant management regarding needed corrections of environmental conditions.
2. Advice to the management and medical supervisor as to the relative toxicity of materials or processes, and advice concerning new materials prior to their introduction into the industry.
3. Assistance in developing, maintaining and analyzing absenteeism records.
4. Consultant service to medical supervisors, private physicians, compensation authorities and other state agencies regarding illness affecting workers.
5. Provision of necessary laboratory service of both a clinical and a physical nature.
6. Integration of the activities of other public health bureaus in their programs for workers; for example, the control of cancer, syphilis and tuberculosis.

Determinations of the scope and nature of industrial health problems in any locality are necessary to indicate

the kind, magnitude and direction of work to be undertaken. Most of the industrial hygiene units in state health departments are now in the process of conducting or have recently completed preliminary industrial hygiene surveys. Fundamental information of this character provides a basis for extensive education of industrial officials and physicians in order to secure reliable reports on absenteeism due to occupational disease and other illnesses. Representatives from divisions of industrial hygiene in the state and federal governments constitute the National Conference of Governmental Industrial Hygienists, the objectives of which are to promote industrial hygiene and sanitation in all its aspects and to coordinate these activities as conducted by governmental units. Annual meetings are conducted to accomplish these purposes.

INDUSTRIAL MEDICAL EDUCATION

The training which physicians receive in industrial health could be greatly improved. This fact has made it necessary to investigate the availability of educational facilities in industrial health and to determine the possibilities for expansion. The tabulations and discussion which follow represent an attempt by the Council on Industrial Health to determine whether the medical profession has been hampered in its relationship to a useful and growing segment of medical enterprise through negligent emphasis on undergraduate and post-graduate teaching programs.

Few practitioners in present day industrial medicine have had opportunity for formal education. Varying degrees of proficiency have been attained through personal experience or apprenticeship. Such traditional methods are successful in medical education until information has been assembled, special technics elaborated and precise knowledge accumulated sufficient to establish a special field of medical interest. When that point is reached, experience demonstrates that organization of instruction leads to more efficient preparation. Time is saved, the spread of authentic information is greater, the interests of patients are more adequately safeguarded and, in general, the gap between knowledge and practice is materially reduced.

Industrial health as practiced today is not a restricted field. In this respect it resembles all other special provinces of medical interest. Physicians engaged in industrial practice in a limited way believe that any one with good basic medical equipment can successfully conduct an industrial practice with certain adaptations which are to be gained largely through experience. A contrary point of view is expressed by those engaged in industrial practice full time, who state that industrial health requires a degree of preparation on the part of those who elect to serve therein quite as exacting as to be found in any other specialty. Furthermore, they contend that successful industrial medical specialization demands additional proficiency mainly in the field of administrative practice.

Obviously, the educational requirements for these two groups are dissimilar; but, if growing demands on the profession are satisfactorily to be met, most practitioners will need some training in industrial health to establish competence and some practitioners will need a great deal, in keeping with the varying situations and circumstances under which industrial practice occurs.

PRESENT STATUS OF UNDERGRADUATE TEACHING

The importance of acquainting medical students with the fundamentals of industrial hygiene is rarely questioned by those in charge of teaching preventive medicine in medical schools. There are always difficulties associated with substantial alterations of or additions to teaching schedules. Table 12, representing data collected by the Council on Industrial Health, indicates

TABLE 12.—*Required Instruction in Industrial Hygiene Provided by Medical Schools, 1939-1940*

Medical School	Lectures (Clock Hours)	Field Trips
College of Medical Evangelists.....	1	3-5
University of Southern California.....	1-2	*
Stanford University	5-6	None
Yale University	3	1
Georgetown University	3	3
George Washington University.....	3	None
University of Georgia.....	3	0
Loyola University	2	None
Northwestern University	12	None
University of Chicago.....	5	None
University of Illinois.....	18	None
Indiana University	3	1
State University of Iowa.....	2	2
University of Kansas.....	1-2	None
University of Louisville.....	5-8	2
Louisiana State University.....	1	None
University of Maryland.....	5	1
Boston University †	7	1
Harvard Medical School.....	6	None
Tufts College	7	None
University of Michigan.....	4	None
Wayne University	5	None
University of Minnesota.....	3	None
St. Louis University.....	6	None
Washington University	3	None
Crelighton University	7	1
University of Nebraska †.....	1	None
Albany Medical College.....	2	None
Long Island College of Medicine.....	7	2
University of Buffalo	5	1
Columbia University	5	None
Cornell University	3	1
New York Medical College.....	3	3-4
New York University.....	3	None
University of Rochester †.....	4	1
Syracuse University	2-3	1
Duke University	1	1
University of Cincinnati.....	8	None
Western Reserve University.....	3	None
Ohio State University.....	10	None
Jefferson Medical College.....	8	*
Temple University	3	*
University of Pennsylvania.....	3-4	None
Woman's Medical College.....	22	3-4
University of Pittsburgh.....	16	1
Medical College of State of South Carolina.....	1	1
University of Tennessee.....	3	3
Meharry Medical College.....	6	None
Vanderbilt University	2	2
University of Vermont.....	5	1
University of Virginia.....	5-10	1
Medical College of Virginia.....	12	7

* Sanitary survey.

† Information received for the academic year 1938-1939.

that adequate presentation of industrial hygiene to undergraduates is by no means impossible. Given proper leadership and organization, industrial hygiene can occupy a position of real significance in the time devoted to preventive medical teaching. Industrial hygiene is a function of preventive medicine in most of the medical schools. This relationship is of considerable interest, since such backwardness as industrial hygiene has displayed in attracting the attention of medical educators is a reflection of the difficulties encountered in the teaching of preventive medicine and

public health methods as a whole. As improvement occurs in this larger field, the impression prevails that industrial hygiene will come in for its own share of augmented representation.

Reports have been received on the present status of undergraduate teaching in industrial hygiene from all of the approved four year medical colleges. Fifty-two medical schools shown in table 12 are able to report quantitatively the time assigned to required instruction in industrial hygiene. Six schools are unable to report in this fashion because of the difficulty of applying a numerical value to the industrial hygiene content of conjoint courses, seminars and related preventive medical teaching. Nine schools in which no organized instruction in the subject is given are also omitted from the table. The average allotment of time devoted to industrial hygiene in the listed schools is slightly in excess of five hours. Actually, of the fifty-two schools providing some instruction, twenty exceed this average figure and thirty-two fall below it, the variability

pedics. In a few others, clinical experience of a combined medical-surgical type is made available through industrial outpatient dispensaries. As noted in the case of required instruction, considerable variation exists in the elective courses, ranging from thirty hours of didactic work, field trips and laboratory exercises to elective field trips alone. The degree of student interest also may vary considerably. Elective courses have developed on the basis of student demand. Others have been offered for a number of years with practically no registrants.

CORRELATING EXPERIENCE IN OTHER TEACHING DEPARTMENTS

In many of the medical schools the claim is properly made that lack of emphasis on industrial hygiene in separately conducted preventive medical courses should not be the sole standard by which the adequacy of teaching industrial health as a whole is measured. The basis of this argument rests on the fact that industrial health is a composite of contributions from nearly every other teaching discipline in medical education and its complete presentation is possible only through appropriate experience supplied by departments of surgery, medicine, dermatology, radiology, toxicology and medical jurisprudence. In fact, it has been suggested that the application of preventive methods should not be segregated in separate courses but should form an integral part of the instruction which medical students receive in all clinical courses. Valid as these contentions are, evidence is accumulating that adequate coverage of industrial health is an unusual accomplishment under systems of divided and unrelated responsibility; unless the task of suitable correlation is lodged in one or another of the component teaching units. It is thought that correlation of this character could effectively be undertaken by those in charge of preventive medicine and public health departments, since the educational content of these courses likewise supplies a substantial increment to industrial health training. The essentials of personal and physiologic hygiene, nutrition and housing, vital statistics, general sanitation and control of communicable diseases are all directly applicable. Certainly organization of instruction along these lines should correct to some extent the charges that medical problems surrounding the health of the workers are not adequately presented and that instruction in common occupational health exposures is available only as typical cases happen to be admitted to wards or clinics. It should serve also to reduce the number of complaints relating to inadequacy of training in the care of traumatic injuries, in occupational dermatitis and in industrial toxicology and jurisprudence.

Separate departments of industrial hygiene have been created at the University of Pittsburgh School of Medicine and at the University of Colorado Medical School in the expectation that this type of organization presumably will provide a different but successful solution to teaching industrial health more adequately. Important as such developments may be in undergraduate teaching, greater significance resides in the specialized teaching talent which can be attracted under such a plan, particularly if graduate programs are under consideration.

As the advantages of this type of organization become apparent, other medical schools may follow suit. In fact, such plans have already been contemplated at a number of teaching centers.

TABLE 13.—*Elective Courses in Industrial Hygiene in Medical Schools*

Medical School	Lectures (Clock Hours)		Laboratory Work (Clock Hours)	
		Field Trips		
Stanford University	24	4-6	8-10	
Yale University	30	3	None	
Georgetown University	24	3	None	
University of Illinois.....	22	6	4	
Johns Hopkins University.....	*	..	.....
Harvard Medical School.....	*	..	.....
University of Michigan.....	*	..	.....
Washington University	None	3	None	
Columbia University .....	*	..	.....
New York University.....	None	**	**	
University of Pennsylvania.....	12	1-2	None	
Medical College of Virginia.....	...	***	.....

* Electives available in graduate industrial hygiene courses.

** 100 hours combined field trips and laboratory work.

*** One month full time in an industrial medical department.

extending from one hour of didactic work to as much as twenty-two hours of lectures, associated clinics and demonstrations.

Required laboratory exercises especially in industrial pathology or physiology are omitted from the tabulation, since experience of this type is provided in only four of the medical schools. Field trips which must be considered in the same ratio of importance to industrial hygiene teaching as bedside demonstrations are to clinical medicine and surgery are required in twenty-seven schools. The most effective procedure has usually taken the form of visits to industrial medical services. Another arrangement is to include an investigation of industrial hygiene as part of a required general sanitary survey by each student. In either case the satisfactory nature of the experience is predicated on the degree of supervision exercised, the character of follow-up reports and the presence or absence of associated seminars. In certain schools this phase of the teaching is admirably done. Elsewhere the value of current practices has been seriously questioned.

Table 13 lists the twelve medical schools which offer optional courses in industrial hygiene, all offered by departments of public health and preventive medicine. In several schools, electives are available in other components of industrial health provided by departments of general medicine, surgery, toxicology and ortho-

CONTACT OF THE PROFESSION WITH
INDUSTRIAL HEALTH

Lack of emphasis on occupational problems is accounted for in some medical schools on the assumption that proficiency in industrial practice should be a function of graduate medical education as in the case of any other medical or surgical specialty. This point of view fails to consider the early contact which recent graduates establish with practical industrial medicine, similar in every respect to problems they encounter falling within the scope of other specialties the fundamentals of which are taught in clinical courses. Recent graduates of approved medical schools listed in the American Medical Directory as engaged in general practice have reported to the Council on Industrial Health that nearly 60 per cent are introduced to industrial medicine and surgery very promptly in their professional careers. Almost none of them have had any opportunity to undertake postgraduate training beyond such fortuitous experience as they may have received as house officers in hospitals. Table 15 presents information received from this group of recent medical graduates calculated to determine their appraisal of the adequacy of training in certain components of industrial health. The replies, while they have small value in reference to the adequacy of training received in individual schools, do provide an index to the competence of the average recent graduate to undertake industrial practice. The majority feel that, while first aid surgery and principles of resuscitation are adequately taught, they are not quite so sure about the commoner industrial health hazards. With respect to industrial toxicology, industrial dermatosis, standards of ventilation and illumination, principles of workmen's compensation and casualty insurance relationships, the majority of recent graduates feel that these subjects are inadequately treated and in that descending order. These replies are a direct commentary on the reliability of contributions to industrial health experience provided by unrelated clinical departments without necessary planning and organization. They also refute the attitude that instruction of medical students in industrial health is not practical and that such teaching has no direct bearing on competence in the general practice of medicine.

AVAILABILITY OF TEACHING TALENT AND
CLINICAL MATERIAL

Another explanation provided by certain of the medical schools for inability to develop suitable teaching programs in industrial health refers to the lack of available teaching talent and clinical material. This is particularly true of schools located in nonindustrial areas. Information sought and obtained from a substantial list of physicians in charge of industrial medical departments questions this point of view with respect to most sections of the country. The majority of replies from this source express the belief that recent graduates as a rule are not well prepared to contribute promptly and properly to medical control of working people. The principal criticisms of recent recruits to industrial medicine, aside from almost complete absence of any previous contact with industrial problems, fall in four main classifications:

1. Inability to adjust to the medical control of groups.
2. Poor insight into preventive practice of all types.
3. Almost no conception of disability evaluation.
4. Little conception of the contribution which physicians can make to personnel relationships in industry.

In the opinion of these industrial medical directors, most of the difficulties can be laid at the doors of medical schools as they have failed to use industrial facilities to extend the knowledge of medical students along industrial lines. The majority express the feeling that these facilities are readily available in nearly every locality and ought to be freely used.

POSTGRADUATE EDUCATION IN INDUSTRIAL
HEALTH

Much more fault ordinarily is found with the lack of adequate graduate opportunities in industrial health than deficiencies in the undergraduate curriculum. In consideration of the degree of industrialization involved, little interest has been exhibited in this country toward the development of centers of advanced training in industrial practice. The meager record may be reported under the following headings:

University Programs.—Existing opportunities for advanced instruction have developed in the same way noted in the discussion of undergraduate teaching as part of the larger field of preventive medicine. Since most of these opportunities are designed for candidates interested in higher public health degrees, there has been little disposition to distinguish between such educational

TABLE 14.—Schools Providing Advanced Industrial Hygiene
Instruction Available to Medical Graduates

Massachusetts Institute of Technology
Yale University School of Medicine
School of Hygiene and Public Health of Johns Hopkins University
Harvard University School of Public Health
De Lamar Institute of Public Health of Columbia University College of Physicians and Surgeons
Loyola University School of Medicine
Graduate School of University of Pennsylvania
University of Michigan Medical School
University of California School of Medicine

requirements and those needed to turn out a well trained plant medical director. The necessary basic information may be identical in all cases but the practical superstructure might be somewhat different. In any event, physicians may be deterred from undertaking further training in industrial health if the only means for so doing involve registration for all courses leading to certification or a degree in public health.

Table 14 lists those schools which report industrial hygiene as a component of advanced courses in public health and preventive medicine. Two of them are in schools of public health; the remainder are associated with advanced public health training either in medical or in graduate schools. A great deal of variation exists in the amount of time devoted to industrial hygiene and the availability of suitable clinical material just as in the case of the undergraduate schools. In certain of these schools it is possible to plan an individual program for the capable graduate student adjusted more or less to his needs and interests both as to time and as to content.

The number of short continuation courses under university auspices is likewise strictly limited. Efforts along these lines have been successful at Buffalo, Northwestern, Wayne, the New York Postgraduate School and Pittsburgh universities, the latter in conjunction with the county medical society.

Nevertheless there are some encouraging prospects for a substantial growth in university controlled gradu-

ate courses in industrial health in the near future. Most of these plans depend on the augmentation of teaching programs in public health departments. In one or two instances, plans are being undertaken to organize institutes of industrial health open to a variety of candidates including graduate medical students. The opportunities available under such an arrangement would appear to come closer to meeting the needs of the practitioner interested in a plant medical service than has yet been attained.

Special Professional Societies and Organizations.—The special professional societies in the field of industrial medicine and surgery have made very effective contributions toward the dissemination of reliable information in the field of industrial medicine and surgery. Benefits derived by the membership do not extend to private practitioners who provide the greater part of medical service in industry, except as they have access to official publications and proceedings. Such organizations as the American Association of Industrial Physicians and Surgeons and its component societies, the industrial sections of the American Medical Association

TABLE 15.—*Replies of Recent Graduates on the Adequacy of Training in Certain Components of Industrial Health*

Components of Industrial Practice	Adequate	Inadequate	No Answer
First aid surgery.....	131	46	4
Resuscitation.....	120	38	3
Common industrial hazards.....	98	79	4
Personal hygiene of workers.....	79	98	4
Industrial toxicology.....	74	103	4
Industrial dermatoses.....	71	106	4
Ventilation and illumination.....	67	109	5
Workmen's compensation.....	35	143	3
Casualty insurance relationships.....	23	153	5
	Yes	No	No Answer
Hospital experience improved acquaintance with industrial medicine.....	114	62	5
Any special studies undertaken.....	13	160	8

and the American Public Health Association, the National Safety Council, the clinical conferences of the American College of Surgeons, railway surgical societies and members of district, state and local bodies fall into this category.

In addition, independent organizations have over a period of years arranged for special seminars on industrial health topics. Typical examples are the Saranac Symposiums on Silicosis and the meetings of the Air Hygiene Foundation. The United States Public Health Service has also supplied training for the benefit of personnel in industrial hygiene units of state boards of health.

State and County Medical Societies.—The survey of postgraduate medical education conducted by the Council on Medical Education and Hospitals of the American Medical Association indicates that industrial health has received almost no consideration as a topic for presentation. Traumatic surgery is the only component which has aroused any considerable interest. In a series of answers submitted by 479 industrial physicians, 165 report that their county medical societies devote time to discussions of industrial health. Nevertheless it is safe to say that on the whole there has been little organized effort to acquaint the practicing profession with best methods to improve the physical and environmental status of workers.

Considerable improvement is looked for in this respect. The Council on Industrial Health has inaugurated an annual congress on industrial health which will serve to acquaint the practicing profession with current developments in this field. These congresses will be supplemented by postgraduate educational programs in the state societies under the stimulus of the committees on industrial health in the constituent organizations. It is expected also that as these plans materialize there will be greater attention to industrial medical affairs in county medical society meetings and committee deliberations. In this way a fuller realization of the importance of industrial health will be provided the organized medical profession or at least there will be an opportunity to arrive at accurate conclusions as to why there is lack of interest and the best means of combating it.

Internships, Residencies and Fellowships.—The degree to which hospital experience augments acquaintance with industrial medicine is reported in table 15. One hundred and five, or 67 per cent, of recent graduates reached by questionnaire have stated that their knowledge of occupational health problems was improved by hospital training. These additions to industrial health knowledge probably occurred with few concerted attempts on the part of staff intern committees to organize the instruction. The opportunities available through hospital training have not received the attention which they deserve and the Council on Industrial Health will be interested in determining whether the available industrial clinical material in hospitals is diversified enough to be effectively used in these directions.

Hospital experience may also contribute to the training of industrial physicians by the residency method. There are only a handful of approved residencies bearing on industrial health, all falling in the field of traumatic surgery. If hospitals can supply contact with suitable clinical material both bed and ambulatory, and if such training can be combined with additional periods of laboratory experience for basic instruction in industrial pathology and physiology and with a period of controlled service in a well conducted plant medical department, the resulting product should be a very acceptable one to industry. Such a plan would have the effect of formalizing and organizing educational opportunities for graduates interested in industrial medical practice in a fashion which has served effectively in all other specialty programs and relieve the universities of the full burden of providing acceptable advanced instruction.

But few fellowships are reported except as they relate to specific problems of investigation in one or the other of the components of industrial health as, for example, air conditioning, fever therapy and chemical exposures. Social security fellowships have been available designed to enhance the qualifications of the present personnel in divisions of industrial hygiene in state boards of health. Appointments of this type deserve great extension if any considerable reservoir of teaching and investigative ability is to be developed. They offer an exceptional approach to a sound understanding of industrial health from the graduate teaching point of view provided the character of support and the necessity for original investigation do not narrow concepts so appreciably as to make adequate experience negligible outside the field of primary interest.

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SATURDAY, FEBRUARY 17, 1940

MEDICINE IN INDUSTRY

Industry deals with men as well as with machinery and materials. Only recently, however, has industry begun to realize that the man who operates the machine and who fabricates the material is its most valuable asset. As this conviction grows, fostered by both manufacturing and trade associations, employers are beginning to look more and more to the medical profession for assistance in conserving the physical welfare of man power. Already medicine has, under a variety of circumstances and in all types of industry, so convincingly demonstrated its value in reducing lost time from preventable accidents and diseases that it has come to be considered quite as indispensable as any other of industry's maintenance functions.

Probably it will never be easy to bring to industry generally the advantages of medical and engineering control over unhealthful industrial exposures. Aside from those ordinary activities of medical service in industry usually included under emergency surgery, industrial hygiene and physical supervision, the essential functions of industrial medicine demand study of technologic changes and the introduction of new materials, and the development of methods of control. These difficult procedures require integration and coordination, functions which constitute for the profession at large the principal objectives of the Council on Industrial Health.

Of equal complexity is the problem of unequal distribution of medical service to industry. Large plants, on the whole, have found themselves in the best position to organize medical services. Yet, contrary to common impression, industry in this country is made up predominantly of small units. Ninety-seven per cent of all manufacturing concerns employ fewer than 250 men, and almost 70,000 of them employ five wage earners or fewer. In this segment of industry, accident and disease experience is thought to be less favorable on the whole than in large plants. In this same segment the principal medical service received is first aid and

emergency surgery and care of compensable disability. From the point of view of preventive industrial medical service, the field of the small plant is almost unexplored. When it is found possible to extend qualified preventive medical assistance to such concerns, through the joint agencies of private practice and public health administration satisfactory to those who supply the service and to those who receive it, an achievement will have been recorded in which all elements in the medical profession can take lasting satisfaction.

CHRONIC INDUSTRIAL BENZENE
POISONING

An important and valuable addition to our understanding of the nature of chronic benzene poisoning in industrial workers is furnished by a series of five papers¹ which recently appeared in the *Journal of Industrial Hygiene*. They come from the Labor Departments of Massachusetts and New York, and from the Massachusetts General Hospital and the Hospital of the Rockefeller Institute for Medical Research. To any physician who has flattered himself that he has a clear and well founded picture of this form of industrial intoxication, these papers will bring an unpleasant shock, for they cast doubt on many of the ideas that have been held in the past with regard to pathology, diagnosis, clinical course and susceptibility. Indeed, they leave the impression that here is a disease of decided variability, one which requires the most meticulous examination if a diagnosis is to be made in time to save life. Moreover, the failure to make an early diagnosis sometimes means death to the victim.

The picture of chronic benzene poisoning as generally conceived includes a typical aplastic leukopenia, with or without a marked anemia, thrombocytopenia, increased bleeding time, delayed clotting and complete absence of any regenerative forms, white or red, in the circulating blood. Necropsy reveals a hypoplastic marrow. No other form of blood disease can be attributed to the action of benzene. Women, especially young girls, are more susceptible than men and suffer more severely. Early benzene poisoning can be readily detected by a count, absolute and relative, of the white

1. The papers have been issued in monograph form and can be obtained from 55 Shattuck Street, Boston, price \$1:

Chronic Exposure to Benzene (Benzol): I. The Industrial Aspects, Manfred Bowditch and Hervey B. Elkins, Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston.

Chronic Exposure to Benzene (Benzol): II. The Clinical Effects, Francis T. Hunter, Department of Medicine, Massachusetts General Hospital, Boston.

Chronic Exposure to Benzene (Benzol): III. The Pathologic Results, Tracy B. Mallory, Edward A. Gall and William J. Brickley, Department of Pathology and Bacteriology, Massachusetts General Hospital, and the Office of the Medical Examiner for Suffolk County, Northern Division, Boston.

Benzene (Benzol) Poisoning in the Rotogravure Printing Industry in New York City, Leonard Greenburg, May R. Mayers, Leonard Goldwater and Adelaide R. Smith, Division of Industrial Hygiene, New York State Department of Labor, New York.

The Hematological Effects of Benzene (Benzol) Poisoning, Lowell A. Erf and C. P. Rhoads, Hospital of the Rockefeller Institute for Medical Research, New York.

blood cells or by Yant's test for urine sulfates. A concentration of not over 100 parts per million of benzene in the air may be considered a safe limit.

All these assertions are challenged, more or less positively, by these writers. To take the last first, Bowditch and Elkins state that the concentration should be kept down to 75 parts per million at the most but that even at this point susceptible human beings may develop severe, even fatal, poisoning, which means that there must be close medical, as well as factory, control. Hunter says "It is doubtful whether any concentration of benzene greater than zero is safe over a long period of time."

The classic picture of benzene aplastic anemia is found to be only one of the manifestations of this disease. Hunter, who reports the result of the blood examinations in eighty-nine cases and the clinical course in ten fatal and four nonfatal cases, states that chronic benzene intoxication may bring about polycythemia or anemia, leukocytosis or leukopenia, leukemia or leukemoid blood pictures (either lymphatic or myeloid), eosinophilia, megalocytosis or microcytosis, or the presence of immature marrow elements in otherwise normal blood. Mallory and his colleagues made fourteen necropsies and five biopsies on people exposed to benzene. They

find that the picture in the bone marrow varies from severe hypoplasia to the most extreme form of hyperplasia with extramedullary hematopoiesis, hyperplasia being more common than hypoplasia. The hyperplastic activity in marrow and in other foci may in some cases be hard to distinguish from tumors. The most surprising feature in these two reports is the statement that two of the fatal cases showed not leukopenia but leukemia, one a case of acute myeloid leukemia and the other acute aleukemic leukemia. The necropsy results in both cases confirmed the clinical diagnosis. In the first case a nodule was found in the liver which proved to be a true leukemic tumor, displacing the liver cells. Mallory emphasizes the "neoplastic tendency" of the conditions in all the cases belonging to the hyperplastic types. Among the nine cases observed by Erf and Rhoads, treatment failed in only one, in which an acute myeloid leukemia developed, with death six months after. Here too the appearance at necropsy

was characteristic. There are, therefore, three new cases of benzene leukemia added to the ten already reported in the literature.

The diagnosis of benzene poisoning in an early stage is not easy. Hunter's case histories show that the victim may reach an advanced stage before there are striking blood changes or clinical symptoms. Leukopenia is not the most frequent sign. Both Hunter's group and Greenburg's group find a fall in the red cell count, below 4.5 million, more trustworthy. In the twenty-nine cases examined in Boston, anemia was always present but leukopenia was absent in ten. Yet one of these was fatal. In the New York cases also leukopenia was absent in some of the early cases and also in some of the cases of severe involvement.

Next in importance to the anemia the New York group places an increase in the size of the erythrocytes. These observers also note that thrombocytopenia may be present without prolonged bleeding and delayed clot retraction. The Boston group lays stress on a decrease in the polymorphonuclear percentage, which is a better index of early poisoning than either leukopenia or an absolute polymorphonuclear decrease.

Yant's test for decrease in the proportion of inorganic to organic sulfates in the urine was used by Bowditch and Elkins,

who found a striking difference between forenoon and afternoon specimens. The normal ratio fell as the day went on, to rise again slowly during the course of the evening. They found it a valuable test for benzene absorption.

Hunter says that he did not find any evidence that women are more seriously injured by benzene than men. Mallory says that among his sixteen cases of severe poisoning there were twelve men and four women. Ten of the men showed marrow hyperplasia and only two aplasia, while all four women showed aplasia, which suggests that there is a tendency of the male to react with hyperplasia, which may help to explain, since the hyperplastic form has not yet been generally recognized, the prevailing belief that women are more susceptible than men. His two patients with leukemia were men, and Erf and Rhoads' patient was a man. Of the ten cases reported in the literature, eight were in men.

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

Current Comment

THE SECOND ANNUAL CONGRESS ON INDUSTRIAL HEALTH

The Council on Industrial Health recently concluded the second of its annual congresses on industrial health. The meeting was attended by nearly three hundred leaders in industrial health, including representation from private and industrial practice, officers and members of committees on industrial health in state and county medical societies, directors of industrial hygiene and workmen's compensation in federal and state governments, insurance company officials, industrial and public health nurses, and lay executives and personnel officers of manufacturing enterprises interested in recent developments in the industrial health field. The character of attendance and the interest expressed testified to the need for a meeting of this character designed to clarify from time to time the scope, methods and objectives of all phases of medical practice in industry. Several suggestions were made by participants in the programs which seemed to warrant further exploration. One recommendation referred to the desirability of discussions leading toward closer collaboration in the physical and vocational rehabilitation of the industrially injured among representatives of organized medicine, workmen's compensation administration and rehabilitation agencies. The individual injured worker might profit considerably if all agencies designed to restore him to earning capacity worked together rather than at cross purposes, as all too frequently occurs under present uncoordinated conditions. Another suggestion was to the effect that the Council on Industrial Health should enlist the aid of appropriate sections in the Scientific Assembly of the American Medical Association to develop whenever possible uniform points of view about the relation of trauma to disease and also to inquire into the possibility of standardizing disability evaluation. The work of the Section on Ophthalmology in relation to disability rating for visual loss was cited as an example of what can be accomplished under proper interest and leadership.

THE RANDOLPH CASE

Newspapers in Philadelphia recently waxed well-nigh hysterical again about the case of an infant who died, it is said, not only because of failure to get a physician but because the physician ultimately reached failed to respond to the call. Now a calm, dispassionate investigation is reported in the *Weekly Roster*, bulletin of the county medical society. The baby, named Randolph, was 1 month old. The mother was delivered without a physician but with the assistance of a neighbor woman. The parents, who had four other children, had been on relief for the past five years. The mother observed at 8 a. m. that her baby was ill. At 8 p. m., according to the newspaper account, she sent to a neighbor's house for the father, who sent his two older children to get a physician. Walking through the cold after dusk on Sunday, these youngsters passed the homes of several doctors but, seeing no lights, passed by. They did not ring the door bells or knock. When

the children returned two hours later, the mother had her daughter telephone the doctor who had been called when her delivery had already been facilitated by a neighbor. This doctor lived three miles away and had emergency work which would keep him busy for an hour. He urged the Randolphs to try the neighborhood physicians again. The mother now "walked" the baby until it went asleep. When she awoke at 12:40 a. m., the baby was white. She sent the husband for the police, who took the baby to the hospital, where it was pronounced dead. Apparently the mother had assumed that the physician who had attended her would drop all other cases regardless of their seriousness and come at once. She made no further effort to get a physician near her home. Actually he was busily engaged with two other emergency cases that might also have proved fatal. This fact the Philadelphia newspapers ignored. Philadelphia has 4,221 physicians, eighty-eight hospitals, more than 384,000 telephones and several directories of physicians; also a large number of adult persons who could run errands. Had the quest for a doctor been intelligently conducted by neighbors or other adults, a physician would have been obtained.

AMINO ACIDS OF CANCEROUS TISSUE

The search for chemical distinctions between normal and cancerous tissues has been diligently prosecuted in an effort to gain an insight into the factors involved in causing the rapid, unregulated growth of malignant tissue. The suggestion that several amino acids in malignant tissues occur as the unnatural stereo-isomers has been cited¹ as the first definite evidence of a qualitative difference in the metabolism of normal and malignant tissues. Now the accuracy of this initial evidence is questioned. Indeed, a recent investigation² has, by virtue of the specificity of the methods employed and the critical and controlled experiments conducted, quite conclusively demonstrated that the reported existence of large proportions of the unnatural stereo-isomer of glutamic acid or of other amino acids in malignant tissues cannot be correct. Employing a d-amino acid oxidase enzyme preparation which specifically deaminizes only the unnatural stereo-isomers of amino acids, a collaborative research by investigators of Cornell University and of the National Cancer Institute has studied the action of this enzyme preparation on hydrolysates obtained from purified protein preparations, from normal tissues and from a wide variety of malignant tissues. Although a small proportion (less than 3 per cent) of the unnatural stereo-isomers is found in all hydrolysates studied, significant differences were not observed in the relative concentrations of the unnatural forms of the amino acids in malignant tissues as contrasted with normal tissues or to purified proteins. Certainly the great importance initially attached to the type of spatial configuration of certain of the amino acids of cancerous tissue would appear to be unwarranted as far as the problem of the etiology or diagnosis of cancer is concerned.

1. Metabolic Characteristics of Cancerous Tissue, editorial, J. A. M. A. 113: 596 (Aug. 12) 1939.

2. Lipmann, Fritz; Behrens, O. K.; Kabit, E. A., and Burk, Dean: Science 91: 21 (Jan. 5) 1940.

ORGANIZATION SECTION

THE COMMITTEE OF PHYSICIANS FOR THE IMPROVEMENT OF MEDICAL CARE, INC.

REPORT SUBMITTED AT THE REQUEST OF THE EDITOR OF THE JOURNAL

The Committee of Physicians for the Improvement of Medical Care has been in existence about two and one-half years. Its origin, early history and purposes were described in articles which appeared in the *New England Journal of Medicine* (217: 843 [Nov. 18], 884, 887 [Nov. 25] 1937). A short article was also published in *THE JOURNAL* (March 12, 1938, p. 141B). Since then the committee has continued its activities in accordance with the principles and proposals which constituted its original platform.

The general objectives of the committee are set forth in the following quotation from its first statement:

They [the members of the committee] hope that these principles and proposals may suggest the lines along which effort may be made by voluntary, local, state and federal agencies to improve medical care. It is recognized that the medical profession is only one of several groups to which medical care is of vital concern. . . . Nevertheless the medical profession should initiate any proposed changes because physicians are the experts upon whom communities must depend.

The purposes of the committee are further indicated by the following quotations from a statement issued May 5, 1939:

The Committee has embarked on the second part of its work, the critical analysis of general or national movements toward the reorganization of medical care. . . . It is their [its members'] intention to subject to scrutiny and to expose to the light of public opinion, and more especially to the physicians of this country, projects or actions of government or of organized medical or lay groups. . . . They regard their functions as interpretative and educative. They appreciate the presence of all shades of opinion among those to whom they are responsible and have, consequently, tried to avoid arbitrary assertions. They have felt constrained to adopt an uncompromising attitude toward projects or measures that obviously violate the fundamental ends for which they have united, namely the protection and improvement of the quality of medical care. But they are equally solicitous that no systems be imposed of such uniform and stereotyped patterns that experiment and evolutionary development will be deterred. In fact they have proclaimed interest in education and investigation, establishment, maintenance and improvement of standards of competence and merit, the need for expert control, all features that are incompatible with static uniformity.

In this spirit the committee has issued, at intervals, the following statements: Aug. 8, 1938, Report of the National Health Conference; Nov. 26, 1938, Analysis of the National Health Conference and the program presented by the Interdepartmental Committee at that conference, with comments on the action of the House of Delegates of the American Medical Association (Sept. 16, 1938); May 5, 1939, The Wagner Bill (S. 1620) and Its Implications; Aug. 15, 1939, Proposals for Amendment of the Wagner Bill and an abstract of Senate Subcommittee Report (No. 1139) on Establishing a National Health Program.

The committee has repeatedly asserted the adherence of its members to the American Medical Association but has insisted that they and all individuals and groups have not only the right but the obligation to discuss freely any subject affecting medical practice, even if their opinions conflict with the policies and actions of those governing any medical organization.

The committee is now composed of thirty-one physicians. There are approximately 1,000 signatories to the Principles and Proposals and about 150 additional names are on the mailing list. Signature of the Principles and Proposals is not a prerequisite for being placed on the mailing list. The committee remains a self-appointed group. It has been incorporated as a non-profit corporation under the laws of Connecticut for the usual reasons of legal formality. The idea of more formal national organization with local chapters and democratic representation was considered and referred to the signatories but was not acted on for several reasons: the wish to avoid organization propaganda, the uneven distribution of the signatories, the cost involved, and the belief that such organization would give rise to the impression that the committee is working in opposition to and outside the ranks of the American Medical Association. Signatories have been invited to take the initiative, as individuals or as groups, in nominating persons for membership on the committee and suggesting or criticizing activities of the committee.

The work of the committee has been supported thus far by voluntary contributions from members of the committee and the signatories. Its expenses for the year July 1, 1938-1939, amounted altogether to about \$2,500. The committee will be glad to mail to physicians who are interested copies of its statements, or to add their names to its mailing list.

Present members of the committee include:

Dr. Richard M. Smith, chairman	Dr. Channing Frothingham
Dr. Hugh Cabot, vice chairman	Dr. H. Rawle Geyelin
Dr. William J. Kerr, vice chairman	Dr. F. T. H'Doubler
Dr. Russell L. Cecil, honorary chairman	Dr. L. Emmett Holt Jr.
Dr. John P. Peters, secretary	Dr. William S. Ladd
Dr. J. Rosslyn Earp	Dr. H. Clifford Loos
Dr. Robert B. Osgood	Dr. Harry S. Mackler
Dr. S. Borden Veeder	Dr. William S. McCann
Dr. Milton C. Winternitz	Dr. T. Grier Miller
Dr. Philip King Brown	Dr. George R. Minot
Dr. Allan M. Butler	Dr. Hugh Morgan
Dr. Louis Casamajor	Dr. LeRoy S. Peters
Dr. Thomas B. Cooley	Dr. G. Canby Robinson
	Dr. David Seegal
	Dr. John H. Stokes
	Dr. James J. Waring
	Dr. Mortimer Warren
	Dr. Soma Weiss

JOHN P. PETERS, M.D., Secretary, 789 Howard Avenue, New Haven, Conn.

GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

SOUTH CAROLINA

The South Carolina Medical Association has appreciated the necessity for some form of graduate education for the physicians of the state. It has been difficult for many of the physicians practicing in South Carolina to visit the leading medical centers elsewhere for a sufficient period for graduate study. For this reason a workable statewide program of extension training has been needed. Several plans have been tried and, while all have been of some service, not until recently has any one plan seemed to fit the need of the state.

In 1938 a cooperative program was developed between the Medical College of the State of South Carolina and the state board of health. A statewide course in obstetrics was given by the professor of obstetrics in the medical college. Twenty counties were visited from June to September 1938. Six meetings were held in each locality over a six weeks period. Two hours was devoted to illustrated lectures and clinics. Meetings were held in local hospitals whenever possible. Subjects included were treatment of abortions, placenta praevia and separation of the placenta, adequate antepartum care, toxemias of pregnancy, normal labor, operative procedures in obstetrics and puerperal care. Attendance totaled 196 physicians, health officers and nurses. There are 980 members of the South

Carolina Medical Association of the 1,354 licensed in the state. No registration fee was charged for this instruction, since federal funds were utilized.

The Piedmont Postgraduate Clinical Assembly began in 1934 with clinical lectures by Dr. J. R. McCord, who visited six sections of the state under the auspices of the Children's Bureau of the United States Department of Labor. A permanent local organization followed, which had a broader scope. General medicine and surgery have been considered and a new aspect of medicine is stressed each year. Faculty members from medical schools of the South with South Carolina physicians conduct the three day program, which is designed to meet the needs of physicians practicing in South Carolina and neighboring states. A registration fee of \$2 is charged. Attendance has averaged 100 physicians.

The office of the state medical association developed a library in 1938 so that members of the association might have library facilities in the state. Approximately 100 periodicals and 1,000 reference books in medicine are available.

Three sanatoriums in the state have offered conferences in tuberculosis for physicians. At Pinehaven Sanatorium, such conferences have been given annually. It is believed that fifty Negro physicians have taken some instruction in tuberculosis during the past few years.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Bills Introduced.—S. 3266, introduced by Senator Hill, of Alabama, provides for pensions, compensation, retirement pay and hospital benefits to reserve officers of the Air Corps of the Army who were called or ordered into the active military service with the Air Corps, Regular Army, by the federal government for extended military service in excess of thirty days on or subsequent to July 1, 1928, and who suffered disability in line of duty. S. 3269, introduced by Senator Mead, of New York, proposes to authorize a federal appropriation of \$300,000,000 from which loans may be made to public bodies and nonprofit organizations for hospital, water, sewer, stream pollution control, and related projects and facilities. The bill provides that not exceeding \$100,000,000 may be devoted to hospital projects. S. 3279, introduced by Senator Pepper, of Florida, proposes to increase from \$3,500,000 to \$4,500,000 the appropriation for vocational rehabilitation in order that needy disabled persons may receive aid in acquiring artificial appliances. S. 3318, introduced by Senator Sheppard, of Texas, proposes to authorize the appointment of female dietitians and female physical therapy aides in the Medical Department of the Army. H. R. 8289, introduced by Representative Wallgren, of Washington, proposes to authorize not to exceed \$2,500,000 to enable the Secretary of the Interior to construct, equip and operate a hospital for the legally adjudged insane of Alaska. H. R. 8332, introduced by Representative Sumners, of Texas, proposes to prohibit the transportation of obscene literature in interstate or foreign commerce.

STATE MEDICAL LEGISLATION

Mississippi

Bills Passed.—The following bills have passed the house: H. 118 proposing to authorize the Board of Supervisors of Washington County to convey certain land to the city of Leland, on which the city of Leland is to erect a public health center and clinic; and H. 126 proposing to empower the board of supervisors of any county to acquire the necessary real estate and to expend any amount deemed necessary for the erection and maintenance of community public health centers and clinics used in connection with the syphilis eradication program sponsored by public health units of any county.

Bills Introduced.—SCR 6 proposes to create a committee to ascertain and compile full data and information pertaining to the state's charity hospital facilities. H. 174 proposes to authorize the boards of supervisors of the various counties to levy and collect an ad valorem tax not to exceed 2 mills for the treatment of the indigent sick, for the promotion of public health and for the support and maintenance of a full time county health department.

New Jersey

Bills Introduced.—S. 46 proposes to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic. A license to practice chiropractic, the bill provides, confers on the licensee the right to diagnose and to regulate the patient's dietary, sanitary and hygienic habits; to use the title "Doctor" or "Dr." when accompanied by "Chiropractic" or "Philosopher of Chiropractic" or "Master of Chiropractic," or their abbreviations, and to employ nurses; but it does not give the licensee the right to practice medicine, surgery, obstetrics or osteopathy. A. 155 proposes to enact a separate naturopathic practice act and to create an independent board of naturopathic examiners to examine and license applicants for licenses to practice naturopathy, which the bill defines as "that system of the healing art which uses and prescribes the following practices and usages: diagnosis and the practice of the combined physiological, mechanical and material sciences of healing as taught in schools, institutes and colleges of naturopathy, which shall include physiotherapy, hydrotherapy, mechanotherapy, psychotherapy, phytotherapy, electrotherapeutics, corrective and orthopedic gymnastics, external applications, manipulation, and nutritional control." S. 64 proposes that 25 per cent of the receipts from motor vehicle licenses, from auto drivers' licenses and from gasoline tax receipts shall be set aside as a voluntary nonprofit general hospital fund, which is to be disbursed to voluntary nonprofit general hospitals in the state in proportion to the number of beds each such hospital has available for the use of indigent patients injured in automobile accidents.

New York

Bills Introduced.—A. 981 proposes to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license persons applying for

ORGANIZATION SECTION

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Virginia

licenses to practice chiropractic. The bill proposes to define the practice of chiropractic as "the science of locating and the removing of nerve interference in the human body according to chiropractic principles, where such interference is indicated or misalignment or subluxations of the vertebral column appear. It excludes operative surgery, prescription or use of drugs or medicine, of the practice of obstetrics." A. 1005 proposes to repeal existing laws relating to the manufacture, sale, distribution and advertising of foods, drugs and therapeutic devices and to enact a so-called "Consumer's protection act" to regulate the manufacture, sale, distribution and advertising of foods, drugs, cosmetics and health devices. A. 1122 proposes to provide for the supplying at public expense of necessary medical, surgical and hospital care to persons, over 21 years of age, suffering from the after-effects of poliomyelitis, one half the cost to be borne by the county and the other half by the state. A. 1126 proposes to require a pharmacist, on the request of a person for whom he has filled a refillable prescription, to furnish that person a copy of it. A. 1181 proposes to make it a misdemeanor for any hospital, wholly or partly supported by public funds or exempt from taxation, to refuse to admit a private patient willing to pay for the facilities thereof, or to deny to a duly licensed physician or surgeon permission to attend or treat any such patient admitted to the hospital.

Rhode Island

Bill Introduced.—H. 658 proposes a system of compulsory health insurance, the benefits of which are to consist of cash and all forms of medical, dental, nursing and hospital service to be supplied to persons embraced in the compulsory features of the bill and to such others as elect to come under the bill.

Bill Passed.—H. 7 has passed the house, proposing to prohibit the issuance of a license to marry unless both parties to a proposed marriage present a physician's certificate, which is not to disclose any medical finding, that he has conducted such tests and examinations as are required to determine whether there is evidence of syphilis. The bill proposes to require a physician to inform a person whom he has examined for the purpose of executing such certificate and in whom he has found indications as to the presence of syphilis, and the other party to the proposed marriage, the result of the test he has performed, the nature of the disease and the possibilities of transmitting it to the marital partner and to their children.

Bill Introduced.—H. 120 proposes to enact a separate chiropractic practice act and to create an independent board of examiners to examine and license applicants for licenses to practice chiropractic. The bill defines chiropractic "as the philosophy, science and art of locating, any method preparatory to, and the adjustment of the articulation of the spinal column and adjacent bony structure to release the transmission of nerve energy to all parts of the body to correct the cause of disease." The bill proposes to authorize a chiropractor "to use such methods as taught by chiropractic schools and colleges to further assist nature in establishing the normal transmission of nerve energy." Chiropractic, the bill continues, is not to include the use of operative surgery, obstetrics, osteopathy, nor the administration or prescribing of any drug or medicine. A certificate to practice chiropractic is to confer on the licensee the right to practice as may be incident to such practice, and to use the title "Doctor" or "Dr." in connection with his name when accompanied by the word "Chiropractor" or the letters D.C."

OFFICIAL NOTES

SPECIAL BLUE NETWORK BROADCAST

On February 21 from 9 to 9:30 p. m. central standard time (10 to 10:30 eastern standard time, 8 to 8:30 mountain time and 7 to 7:30 Pacific time) there will be a special broadcast by the American Medical Association and the National Broadcasting Company over seventy stations of the Blue network. The subject will be "Pasteur Conquers Rabies." The broadcast will be based on an article entitled "Watch Your Dog!" appearing simultaneously in *Hygeia* and on official reports dealing with the seriousness of the rabies situation in the United States. Special features of the program will be music arranged by Don Markotte of the National Broadcasting Company Music Library from the score which accompanied the motion picture based on the life of Louis Pasteur, starring Paul Muni. This music is made available through the special courtesy of Warner Brothers. An augmented N. B. C. orchestra, directed by Joseph Gallicchio, will render the music. Dramatizations taken from the life of Pasteur and arranged for radio by William J. Murphy will be enacted by a specially selected cast of N. B. C. radio actors, under the direction of J. Clinton Stanley, director of the series *Medicine in the News*.

A limited number of tickets for admission to the studio will be available to physicians in Chicago and vicinity. Tickets will be limited to two per application. Requests should be sent by mail to the Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago, enclosing a stamped, self-addressed envelop. Telephone requests cannot be received. Applications will be filled in the order in which they are received until all the tickets have been distributed.

WOMAN'S AUXILIARY

Louisiana
The auxiliary to the Calcasieu Parish Medical Society met in Lake Charles, October 20. Mr. R. F. Cisco spoke on the "Functioning of the By-Laws of the Association of Commerce." Arrangements were made for donations for Thanksgiving and Christmas food baskets for needy families. Also members were to assist the doctors in establishing the new library in St. Patrick's Hospital. Prizes will be given to children in the parish schools who write the best essays on a subject selected from *Hygeia*. At the November meeting Dr. Walter Moss Cottingham, president of Louisiana College, spoke on "World Events." Mrs. S. M. Blaskshear, president of the auxiliary to the Louisiana State Medical Society, spoke on "Organization and Cooperation" at a meeting of the auxiliary to the Rapides Parish Medical Society, Alexandria, November 10.

Nebraska

Mrs. J. E. M. Thomson, president of the auxiliary to the Nebraska State Medical Association, was guest of honor at the

annual membership tea of the auxiliary to the Omaha-Douglas Counties Medical Society, Omaha, October 17. The auxiliary will place *Hygeia* in the public schools of these counties. At a meeting of the board of directors of the auxiliary to the Nebraska State Medical Association in Lincoln October 16 Dr. A. L. Miller, president of the association, was speaker.

Texas

The Tom Green Eight County Auxiliary met in San Angelo October 2. Mrs. Frank Clark of Abilene discussed legislation. This meeting was attended by sixty-five women representing clubs in San Angelo.

Tennessee

Miss Ellen Graham, of Boonville, read a paper at a meeting of the auxiliary to the Lincoln County Medical Society in Fayetteville recently, entitled "The Life and Work of a Country Doctor," which was published in *The Journal of the Tennessee State Medical Association* and was written by Miss Graham's father, now deceased.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Psittacosis in Arizona.—Three cases of psittacosis have been reported in Tucson, according to *Public Health Reports*, January 12. Two young adults of one family became ill October 7 and November 7, respectively, and a nurse on the first case became ill November 3. The family owned two love birds, which had been shipped from a pet shop in California, April 21, 1939. However, other birds in the same group were examined with negative results, it was stated.

CALIFORNIA

Society News.—The San Francisco County Medical Society was addressed, February 13, by Frances Tomlinson Gardner, librarian, Crummer room, University of California Medical School, on "Pedro Prat, Surgeon of the Spanish Conquest" and Dr. Arthur W. Meyer, Stanford University, "Historical Ideas Regarding Conceptomaterial Relations."—Dr. Frank E. Adair, New York, addressed a joint meeting of the radiologic section of the Los Angeles County Medical Association and the Los Angeles Cancer Society, January 30, on "Management of Breast Cancer."—At a meeting of the Los Angeles Society of Neurology and Psychiatry, January 17, the speakers were Drs. May E. G. Romm on "Notes on a Case of Exhibitionism in the Male" and Leo J. Adelstein, "Neurologic Divining Rods and Their Localizing Value."—At a meeting of the Hollywood Academy of Medicine, February 8, Dr. Robert R. Newell, San Francisco, discussed "Medical Uses of Radiation and Growth of the Specialty of Radiology."

COLORADO

Sewall Memorial Lecture.—Dr. Chester S. Keefer, Boston, delivered the Henry Sewall Memorial Lecture before the Medical Society of the City and County of Denver, January 30. His subject was "Hemolytic Streptococcal Infections: Their Importance in Acute and Chronic Disease."

Plans for the Care of Pneumonia.—Typing stations have been established in various sections of the state and plans adopted to distribute serum and sulfapyridine through the state department of health in the care of indigent patients, according to the *Rocky Mountain Medical Journal*. The program conforms with similar plans now carried out in many states and has the approval of the committee on pneumonia of the Colorado State Medical Society.

DISTRICT OF COLUMBIA

Annual Banquet of University Medical Society.—Harold W. Ickes, Secretary of the Interior, will be the principal speaker at the annual banquet of the George Washington Medical Society, Washington, February 17, which concludes the annual postgraduate clinic of George Washington University School of Medicine. A feature of the banquet will be the twenty year reunion of the class of 1920, which on this occasion intends to present a gift to the medical school.

ILLINOIS

Outbreak of Influenza.—Because more than 100 students and several teachers were ill from influenza, the Drummer Township high school, Gibson City, was closed recently.

Typhoid Carriers at Manteno State Hospital.—Ninety-three typhoid carriers were discovered in a survey at the Manteno State Hospital recently, newspapers reported on February 9. The survey was made following an outbreak of typhoid at the hospital causing the death of fifty-three persons.

No Auto Deaths in Galesburg.—Galesburg, a city of 29,000 population, did not have a traffic fatality in 1939, newspapers report. In Knox County outside of Galesburg there were twelve deaths as a result of automobile accidents. Galesburg has been carrying on an intensive campaign against these accidents. The police have concentrated on enforcing traffic

laws. Since schoolboy patrols went on duty this year at all the city schools, no pupil has been struck by a car.

Society News.—Dr. Willis C. Campbell, Memphis, Tenn., discussed "Internal Fixation of Fractures" before the Sangamon County Medical Society in Springfield, January 4.—At a meeting of the Logan County Medical Society on January 25, Drs. Ralph A. Reis and Harold J. Noyes, Chicago, discussed "Management of the Puerperium and Its Complications" and "Present Status of Dental Caries from the Standpoint of Knowledge of Etiology, Treatment and Dental Caries as an Index of Nutritional Adjustment" respectively.

Chicago

Clinical Meeting at Billings Hospital.—The clinical section of the Chicago Heart Association will meet at Billings Hospital, February 23. Dr. Arlie R. Barnes, Rochester, Minn., will be guest at the meeting. The following program has been arranged:

Drs. Dallas B. Phemister and Richard Sternheimer, Two Cases of Adhesive Pericarditis Treated Surgically.
Dr. Edith L. Potter, Embryological Background of Cardiac Malformations.
Dr. Andrew J. Brislen, The Clinical Measurement of Heart Size.
Dr. Wright R. Adams, Limitations of Objective Circulatory Measurements.
Dr. Louis Leiter, The Relation Between the Heart and Kidneys.
Dr. Barnes, Some Important Diagnostic Correlations of Electrocardiograms and Clinical Types of Heart Disease.

Medical Science and the Administration of Justice.—Dr. Alan R. Moritz, professor and head of the department of legal medicine, Harvard Medical School, Boston, will deliver the sixteenth Ludvig Hektoen lecture of the Frank Billings Foundation of the Institute of Medicine of Chicago, February 23, on "Medical Science and the Administration of Justice." On the same day there will be a medicolegal conference under the auspices of the institute's committee on local medicolegal problems with Dr. Oscar T. Schultz, Evanston, as chairman. The morning session will be held in the amphitheater of Cook County Morgue and will be given by the scientific staff of the county coroner's office. Albert J. Harno, dean of the college of law, University of Illinois, will preside at the afternoon session at the university's college of medicine. Speakers will include Capt. John I. Howe, Chicago Police Department; Dr. Israel Davidsohn; Fred E. Inbau, director of the Chicago Police Scientific Crime Detection Laboratory, and Benjamin C. Bachrach, public defender of Cook County. A tour will be made of the Chicago police laboratories, where there will be demonstrations of document examination, detection of deception by the lie detector, bombs and explosives, fingerprint examination and the study of blood stains, seminal stains and hair.

LOUISIANA

Graduate Medical Assembly—Dr. Matas Honored.—The fourth annual meeting of the New Orleans Graduate Medical Assembly will be held at the Roosevelt Hotel, February 26-29, in New Orleans. This year the assembly has been dedicated to Dr. Rudolph Matas, professor of general and clinical surgery, emeritus, Tulane University of Louisiana School of Medicine, New Orleans, in honor of his sixtieth year in active practice. The evening session of the first day will be in honor of Dr. Matas. Dr. Elliott C. Cutler, Boston, will speak on "Rudolph Matas—Dean of American Surgery" and Dr. Matas on "Along the Highways of Medicine in Louisiana." Included among the speakers on the scientific program will be:

Dr. William J. Diekmann, Chicago, Types and Ambulatory Treatment of Patients with Toxemia of Pregnancy.
Dr. Henry L. Bockus, Philadelphia, The Clinical Status of Chronic Gastritis.
Dr. Eldridge L. Eliason, Philadelphia, Team Work in the Treatment of Biliary Disease.
Dr. Henry E. Michelson, Minneapolis, Treatment of Common Skin Diseases.
Dr. Shields Warren, Boston, Effects of Radiation on Tumors and Normal Tissues.
Dr. Quilman U. Newell, St. Louis, Radiation Therapy in Gynecology.
Dr. Francis M. Rackemann, Boston, The Pathology of Asthma.
Dr. James S. McLester, Birmingham, Ala., Role of the Vitamins in Human Nutrition.
Dr. David P. Barr, St. Louis, The Relationship of the Pituitary Gland to the Body as a Whole.
Dr. William F. Braasch, Rochester, Minn., Hypertension and the Surgical Kidney.
Dr. Donald S. Childs, Syracuse, N. Y., Radiology and the General Practitioner.
Dr. Arthur J. Bedell, Albany, N. Y., Medical Ophthalmoscopy.
Dr. Henry W. F. Woltman, Rochester, Minn., Neuritis.
Dr. Virray P. Blair, St. Louis, Importance of Early Clinical Recognition of Cancer of the Face and Mouth.
Dr. William Mithoefer, Cincinnati, What the General Practitioner Should Know Concerning the Nasal Accessory Sinuses.
Dr. Marius N. Smith-Petersen, Boston, Arthroplasty of the Hip.
Dr. John A. Toomey, Cleveland, Chemotherapy in Acute Infectious and Contagious Diseases.
Dr. Fred M. Smith, Iowa City, Cardiac Therapy.

MEDICAL NEWS

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MICHIGAN

State Society Appointments.—At a meeting of the council of the Michigan State Medical Society in Detroit, January 13-14, Dr. Ray S. Morrish, Flint, was appointed counselor of the sixth district to fill the unexpired term of Dr. Irving W. Greene, Owosso, who resigned, and Dr. Otto O. Beck, Birmingham, counselor of the fifteenth district to fill the unexpired term of Dr. George A. Sherman, Pontiac, who resigned. Drs. L. Fernald Foster, Bay City, and William A. Hyland, Grand Rapids, were reelected secretary and treasurer, respectively.

Personal.—Dr. William J. O'Reilly, Saginaw, was honored at a banquet given by the Saginaw County Medical Society, January 30, in recognition of his completion of fifty years in the practice of medicine. Dr. Charles E. Stewart, executive officer and president of the board of trustees of Battle Creek Sanitarium, was guest of honor at a banquet, January 17, marking his completion of fifty years in the practice of medicine. Dr. Thomas R. K. Gruber, Eloise, was presented with an honorary membership in the Wayne County local number 25, American Federation of State, County and Municipal Employees, at a testimonial dinner, January 25. Glenn Coleman, president of the local, was toastmaster at the dinner.

MINNESOTA

University News.—Mrs. John Dwan has given \$5,000 to the Minnesota Medical Foundation to support a program of the Human Serum Laboratory, which was established at the University of Minnesota Medical School, Minneapolis, in 1938. The laboratory is administered by a committee including Drs. Irvine McQuarrie, Paul F. Dwan and Erling S. Platou as a research and service project on the use of human serum for the prevention and treatment of certain infectious diseases. Dr. Albert V. Stoesser, associate professor of pediatrics, University of Minnesota Medical School, has received a grant-in-aid from the John and Mary R. Markle Foundation in support of his studies on water and electrolyte metabolism in intractable asthma.

Dr. Hilleboe Named to New Post of Medical Coordinator.—Other Appointments.—Dr. Herman E. Hilleboe, St. Paul, head of the bureau of crippled children, division of social welfare, has been appointed medical coordinator for the state department of social security, according to the Minneapolis Journal. Dr. Malvin J. Nydahl, since 1937 director of hygiene and health education in Minneapolis public schools, succeeds Dr. Hilleboe in the work for crippled children. The position of medical coordinator was created by the reorganization act of 1939. The appointment marks the beginning of an expanded program to correlate the medical services under the department of social security. Dr. Hilleboe will directly supervise all purely medical functions and establish working agreements with other state departments in joint medical rehabilitation programs, it was stated. Medical consultation will be provided for various state institutions and special assistance tendered where needed throughout the department. An advisory committee was also announced composed of Drs. Alfred W. Adson, Rochester, chairman; Ludwig L. Sogge, Duluth, and Chester Simons, Swanville; William A. Coventry, Windom; Edwin J. A. Stewart, Minneapolis. Ex officio members are Drs. Albert J. Chesley, St. Paul, secretary of the state board of health; Mr. R. R. Rosell, St. Paul, executive secretary of the Minnesota State Medical Association, Dr. Hilleboe and Walter H. Finke, chairman of the social security board and director of the social welfare division. Special technical subcommittees of three members each will be named later to act as consultants in special fields, such as orthopedics, tuberculosis and dental care. Dr. Hilleboe was formerly director of the division of tuberculosis and services for crippled children under the old state board of control. Announcement was also made of the appointment of Dr. William Rademaker, Evansville, as head of the bureau for aid to county tuberculosis sanatoriums.

NEW JERSEY

Society News.—Drs. John W. Gray, Newark, and George H. Lathrop, Morristown, addressed a stated meeting of the Academy of Medicine of Northern New Jersey, Newark, February 15, on "The Internist's Attitude Toward Infection in the Teeth, Sinuses and Tonsils." Dr. John S. Lundy, Rochester, Minn., will address a meeting of physicians and dentists at the academy, February 27, on "Intravenous Anesthesia," with discussion by Dr. Henry S. Ruth, Merion Station, Pa. Dr. Henry M. Thomas Jr., Baltimore, addressed the section on

medicine and pediatrics, February 13, on "Hypertension, Early Recognition and Management."—Dr. Harold E. Pardee, New York, addressed the Essex County Medical Society, Newark, February 8, on "Treatment of Arteriosclerotic Heart Disease" and Drs. Charles E. North, New York, and Elmer G. Wherry, Newark, on "Milk Standards."—Dr. William Wayne Babcock, Philadelphia, addressed the Bergen County Medical Society at Bergen Pines, February 13, on "Tumors of the Intestine."—Dr. Eugene P. Pendergraft, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, January 18, on "The Role of the Radiologist in the Diagnosis of Intestinal Disease." Dr. Isidor S. Rabinowitz, Philadelphia, addressed the society, February 15, on "Blind Tract Disease."

NEW MEXICO

Public Health Meeting.—Dr. Roscoe P. Kandle, Clovis, was chosen president-elect of the New Mexico Public Health Association at its recent annual meeting and Dr. John C. Mitchell, Silver City, was installed as president. Dr. Frank W. Parker Jr., Santa Fe, was elected secretary. Guest speakers included Drs. Ethel C. Dunham of the U. S. Children's Bureau, Washington, D. C., and Platt W. Covington of the Rockefeller Foundation, Salt Lake City, Utah.

NEW YORK

Society News.—Dr. Samuel W. Clausen, Rochester, addressed the Onondaga County Medical Society, Syracuse, February 6, on "Obstruction of the Alimentary Tract."—Speakers at the winter meeting of the Madison County Medical Society in Oneida, January 18, were Drs. Sydney W. Stringer, on "The Vaginal Discharge"; Leon E. Sutton, "Early Local Care of Traumatic Wounds, with Special Reference to Wounds of the Face," and Earle E. J. Mack, "A Treatise on Vitamin Deficiencies." All are of Syracuse.—Dr. Plimpton Guptill, Rochester, addressed the Jefferson County Medical Society, Watertown, January 11, on diseases of the gallbladder.

New York City

Personal.—Dr. Morris L. Ogan, who recently retired after thirty-five years on the staff of the New York City Department of Health, was honored by his fellow workers at a dinner, January 6, at the Elks Club. Dr. Ogan was administrative assistant in the bureau of district health administration in charge of child and school health.

Friday Afternoon Lectures at the Academy.—The series of Friday afternoon lectures at the New York Academy of Medicine for the remainder of the season will be as follows:

- Dr. Soma Weiss, Boston, Types of Syncope and Their Treatment, March 1.
- Dr. Walter L. Niles, The Medical Treatment of Pain, March 8.
- Dr. Byron P. Stookey, What Neurological Surgery Can Do for the Relief of Intractable Pain, March 15.
- Dr. Arthur C. De Graff, An Evaluation of Some of the Newer Drugs, March 29.
- Dr. William P. Thompson, An Evaluation of Newer Laboratory Methods, April 5.
- Dr. Francis Carter Wood, A Critical Evaluation of the Diagnostic and Prognostic Tests for Cancer (The Bulkley Lecture), April 12.
- Dr. Walter O. Klingman, Recent Advances in Treatment of Somatic Phenomena in Psychoneuroses, April 19.
- Dr. Leo M. Davidoff, Recent Advances in the Diagnosis and Treatment of Diseases of the Central Nervous System, April 26.

Society News.—A symposium on recent advances in chemotherapy was presented before the Bronx County Medical Society January 17 by Drs. Reuben Ottenberg, who discussed streptococcal infection; Josephine B. Neal, meningitis; Cassius J. Van Slyke, gonorrhea, and Wheelan D. Sutcliffe, pneumonia. Dr. Herman J. Burman addressed the Bronx Otolaryngological Society January 23 on "Neck Infections."—William Cramer, Ph.D., addressed the Bronx Pathological Society January 16 on "The Etiology of Cancer."—Drs. Nathan B. Van Etten, President-Elect of the American Medical Association, and Terry M. Townsend, president of the Medical Society of the State of New York, addressed the Medical Society of the County of Queens January 30 on "The American Health Program" and "The Doctor Looks at the Citizen" respectively. Dr. Eli Jefferson Browder, Brooklyn, delivered a Friday afternoon lecture, February 2, on "The Use and Abuse of Dehydrating Agents in the Treatment of Head Injuries."—Speakers at the annual meeting of the New York Heart Association, January 23, were Drs. John G. Gibson II, Boston, "Some Observations on the Blood Volume in Heart Disease" and Charles Sidney Burwell, Boston, "Studies of the Circulation During Pregnancy."

NORTH CAROLINA

Annual Postgraduate Course.—The University of North Carolina School of Medicine and the extension division are sponsoring their third annual postgraduate course in medicine in Charlotte. The series of lectures is as follows:

- Dr. Albert M. Snell, Rochester, Minn., Problems Presented by the Symptom Jaundice, February 6.
Dr. Tom D. Spies, Cincinnati, Diagnosis and Treatment of Vitamin Deficiencies in Man, February 13.
Dr. Walter E. Dandy, Baltimore, Mènière's Disease and Other Vertigoes: Cranial Neuralgias and Other Diseases and Lesions of the Cranial Nerves, February 20.
Dr. Udo J. Wile, Ann Arbor, Mich., Diagnosis and Treatment of Syphilis, March 5.
Dr. James H. Means, Boston, Thyroid and Other Endocrine Disorders, March 12.
Dr. Emil Novak, Baltimore, Management of the Menopause, March 19.

OREGON

Changes in Health Officers.—Dr. David R. Rich, La Grande, has been appointed health officer of Union County, it is reported.—Dr. Lenor S. Goerke, McMinnville, has resigned as health officer of Yamhill County to go to Yolo County, Calif.; Dr. Hallister M. Stolte, Portland, is acting head of the department, newspapers report.

Personal.—Dr. Joseph B. Bilderback, Portland, was honored at a gridiron dinner given by about 300 friends at the University Club in Portland, January 5, in recognition of his recent election to the presidency of the American Academy of Pediatrics. Dr. Ralph A. Fenton, on behalf of the group, gave Dr. Bilderback a silver bowl.

PENNSYLVANIA

Special Meeting of Delegates.—A special meeting of the house of delegates of the Medical Society of the State of Pennsylvania will be held in Harrisburg, February 28, for consideration of a report on the proposed plan for the Medical Service Association of Pennsylvania.

Society News.—Drs. Dickinson Sergeant Pepper, Philadelphia, and Dale C. Stahle, of the state department of health, Harrisburg, addressed the Dauphin County Medical Society, Harrisburg, February 6, on "Treatment of Pneumonia" and "Pneumonia Problems in Pennsylvania" respectively.—Dr. Joseph C. Yaskin, Philadelphia, will address the Harrisburg Academy of Medicine, February 20, on "The Commoner Neuritides and Neuralgias, Their Diagnosis and Treatment."

Philadelphia

University Class Reunion.—The class of 1911 of the University of Pennsylvania School of Medicine will hold its thirtieth reunion this year instead of in 1941 in order to participate in the bicentennial celebration of the university to be held in September. The class will have a luncheon and dinner, September 19, at the Pine Valley Country Club, Clementon, N. J. Dr. Wilbur H. Haines, Philadelphia, is secretary.

Symposium on Allergy.—The Philadelphia County Medical Society held a meeting on allergy, February 14, with the following speakers: Drs. James Alexander Clarke Jr., on "Early Diagnosis of Asthma"; Austin T. Smith, "Management of the Nose and Paranasal Sinuses in Asthma," and Francis M. Rackemann, "Theory and Mechanism of Allergy." Dr. Richard A. Kern was the commentator.

Personal.—Mr. William H. Donner, founder of the International Cancer Research Foundation, received the honorary degree of doctor of laws from the University of Pennsylvania at the midyear convocation.—Dr. Milton Fraser Percival was recently elected president of the Medical Club of Philadelphia and Dr. Edward B. Krumbhaar of the College of Physicians of Philadelphia.

RHODE ISLAND

Society News.—Lester A. Round, Ph.D., state director of health, and members of his staff addressed a special midwinter meeting of the Rhode Island Medical Society in Providence, January 24, on "The State Department of Health, Its Organization and Functions."—Dr. Louis K. Diamond, Boston, addressed the Providence Medical Association, February 5, on "Treatment of Anemias in Infancy and Childhood with Special Reference to Splenectomy."—Dr. Milton C. Winternitz, New Haven, Conn., addressed a meeting of the Rhode Island Society of Neurology and Psychiatry, February 12, at the State Hospital for Mental Diseases, Howard, on "The Pathology of Arteriosclerosis."

TENNESSEE

Division of Tuberculosis in State Health Department.—A separate division of tuberculosis has been set up in the state department of health, it is reported. Dr. Roydon S. Gass, Franklin, who has been in charge of the field diagnostic service for tuberculosis for several years, will be in charge of the division, which was authorized by the 1939 legislature. The program of the new unit will consist of study and research, case finding and hospitalization. A new hospitalization service was recently instituted by the department (THE JOURNAL, Sept. 16, 1939, p. 1140).

Society News.—Dr. Edward L. Turner, Nashville, addressed the Nashville Academy of Medicine and Davidson County Medical Society, Nashville, January 9, on "Some Clinical Manifestations Resulting from Endamoeba Histolytica Infections."—Dr. William E. Chamberlain, Philadelphia, addressed the Chattanooga and Hamilton County Medical Society, January 18, on "Pitfalls in X-Ray Diagnosis."—Drs. James W. Bodley and Emmett R. Hall, Memphis, addressed the Madison County Medical Society, Jackson, January 2, on infections of the hand and arm, and the more common dermatoses, respectively.

Internships Available.—Announcement is made of two internships in pathology at the John Gaston Hospital, the teaching hospital of the University of Tennessee College of Medicine, Memphis. The term of service is for one year dating from July 1. Lodging, board, uniforms, laundry and \$20 a month are offered. After the internship one of the two men would be eligible for a two year appointment as assistant resident pathologist at the hospital and assistant in pathology in the medical school for the term July 1, 1941, to July 1, 1942. The hospital will furnish lodging, board, uniforms and laundry and the university a salary of \$32.50 a month. Following that period an appointment as resident pathologist will be available for the period July 1, 1942, to July 1, 1943. Lodging, board, uniforms and laundry will be furnished by the hospital and a salary of \$65 a month by the university. Investigative work will be encouraged, according to the announcement. The John Gaston Hospital is a general hospital of 550 beds, with annual admissions of 15,976 to the hospital and 155,758 visits to the outpatient department. Applicants are requested to submit full information, including name in full, place of birth, present address, age, sex, nationality, religion, whether he is single or married, academic training, date of finishing present appointment, date on which service could begin, two recommendations and a photograph. Dr. Harry C. Schmeisser is chief of the division of laboratories at the hospital.

UTAH

Resolutions Concerning Licensure.—The Utah State Examining Committee of Physicians and Surgeons of the Department of Registration at a meeting, January 17, adopted a resolution requiring candidates for licenses who have had the major portion of their education in foreign schools to furnish satisfactory evidence of moral and educational qualifications and to pass the state board examinations. The committee also approved a resolution requiring all applicants to be graduates of medical schools approved by the department of registration. Finally the committee recommended to the director of the department of registration that applicants for reciprocal licenses be required to prove that equal privileges are granted by the state or country from which they come. It was pointed out that certain states and foreign countries grant reciprocal licenses only after a physician has practiced a certain number of years. The Utah director was therefore urged not to grant licenses on more favorable terms than those on which such a license would be granted in the state or country in which the applicant is domiciled.

VIRGINIA

McGuire Lectures and Spring Clinic.—The annual Stuart McGuire Lectures of the Medical College of Virginia will be delivered, April 16-17, by Dr. C. Frederic Fluhmann, San Francisco. Dr. Fluhmann's subjects will be "Anesthesia and Analgesia in Obstetrics" and "The Problem of Abnormal Uterine Bleeding." The annual spring postgraduate clinics will be held, April 17, on the general subject "Toxemias of Pregnancy." The speakers will be Drs. Nicholson J. Eastman and Louis H. Douglass, Baltimore; Tiffany J. Williams, Charlottesville, and Francis Bayard Carter, Durham, N. C.

SOCIETY NEWS.—A symposium on diseases of the kidney was presented before the King County Medical Society, Seattle, January 22, by Drs. Frank J. Clancy, Alexander B. Hepler, Alexander H. Peacock and Ole A. Nelson. A symposium on biliary disease was presented on February 5 by Drs. Fred J. Jarvis, Carl S. Leede and William C. Speidel.—Dr. Frank Perlman, Portland, Ore., addressed the Whitman County Medical Society, February 1, on "Phases of Allergy of Interest to the General Practitioner."

WYOMING

Personal.—Dr. Eugene G. Ewing has resigned as health officer of Albany County and Dr. Lee W. Storey, Laramie, has been appointed his successor.—Dr. Thomas B. Croft, Lovell, was elected president of the Northwest Wyoming Medical Society at a recent meeting in Lovell.

PUERTO RICO

University News.—Dr. Frederick J. Brady, of the U. S. Public Health Service, has been detailed to the School of Tropical Medicine conducted at the University of Puerto Rico, San Juan, under the auspices of Columbia University to conduct research in parasitology for six months.—Dr. Guillermo Ruiz Cestero, San Juan, gave a seminar lecture at the School of Tropical Medicine, January 18, on "Fluorography: A New Method of Obtaining Films of the Chest at a Very Low Cost." Dr. Manuel A. Astor, Arecibo, was the speaker, January 11, on "Fractures of the Elbow."—At the annual meeting of the Puerto Rico Medical Association in December the house of delegates approved a resolution expressing its satisfaction and pride in the work of the School of Tropical Medicine and offered support for future undertakings.

GENERAL

Tuberculosis Fellowships Adjourned.—The *Bulletin* of the National Tuberculosis Association announces that the secretariat of the International Union Against Tuberculosis, in agreement with the National Italian Federation Against Tuberculosis, has decided to adjourn competition for six fellowships at the Carlo Forlanini Institute because of European conditions. Fourteen applications had been received from twelve countries, including the United States.

Red Cross Meeting Plans Changed.—The time and place of the annual meeting of the American Red Cross, which was to be held in Atlanta, Ga., May 13-16, have been changed to Washington, D. C., May 6-8. According to a statement by the national chairman, Norman H. Davis, the exceptional pressure occasioned by the European situation has placed such an added burden on the national officers that absence from Washington for four or five days is unwise.

Rheumatism Congress Postponed.—The American Committee of the Ligue internationale contre le rhumatisme and the American Rheumatism Association announce that the seventh International Congress on Rheumatic Diseases, which was to have been held June 8-10 in Philadelphia, Boston and New York, has been postponed "until the European horizon widens." Dr. Ralph Pemberton, Philadelphia, is president of the international league and Dr. Philip S. Hench, Rochester, Minn., of the American Rheumatism Association. Dr. Loring T. Swaim, Boston, is secretary of the American association.

Dr. Gudakunst Medical Director of Infantile Paralysis Foundation.—Dr. Don W. Gudakunst, U. S. Public Health Service, has been appointed medical director of the National Foundation for Infantile Paralysis, effective February 1. He will have his office at the foundation's headquarters at 120 Broadway, New York. Dr. Gudakunst graduated at the University of Michigan Medical School, Ann Arbor, in 1919. He served for many years with the Detroit Department of Health and later as commissioner of health of Michigan. He was also professor of preventive medicine and public health at Wayne University College of Medicine, Detroit.

Goiter Prize Competition.—The American Association for the Study of Goiter again offers the Van Meter Prize Award of \$300 and two honorable mentions for the best essays concerning original work on problems related to the thyroid gland. The essays may cover clinical or research investigations, should not exceed 3,000 words, and must be presented in English. A typewritten double spaced copy must be sent not later than March 15 to the corresponding secretary of the association, Dr. William Blair Mosser, 133 Biddle Street, Kane, Pa.

A place will be reserved on the program of the annual meeting for presentation of the prize award essay by the author. It is possible for him to attend. The essay will be published in the annual proceedings of the association, but this will not prevent its further publication in any journal selected by the author. The next meeting of the association will be in Rochester, Minn., April 15-17. The winner of the 1939 competition was Dr. Theodore L. Althausen, associate professor of medicine, University of California Medical School, San Francisco.

Orthopsychiatric Meeting.—The seventeenth annual meeting of the American Orthopsychiatric Association will be held on February 22-24 at the Hotel Statler, Boston. Among the papers to be presented are the following:

- Dr. William Healy, Boston, Psychiatry and the Treatment of Young Offenders in the Plans of the Committee of the American Institute.
- Dr. Joseph J. Michaels, Boston, Parallels Between Persistent Enuresis and Delinquency.
- Dr. Joseph Lander, Hawthorne, N. Y., A Study of Traumatic Emotional Factors in the Backgrounds of 116 Delinquent Boys.
- Dr. Everett S. Rademacher, New Haven, Conn., Democracy and Mental Hygiene in the Home.
- Dr. Lawson G. Lowrey, New York, Personality Distortion and Early Institutional Care.
- Dr. Fred Temple Burling, Ridgewood, N. J., The Role of the Professionally Trained Hygienist.
- Dr. Charles Bradley and Margaret Bowen, R.N., East Providence, R. I., Amphetamine (Benzedrine) Therapy of Children's Behavior Disorders.

Annual Report of Commonwealth Fund.—Completing its twenty-first year, the Commonwealth Fund in its annual report recalls that its work was begun with gifts for war service and relief and that part of its income was devoted to relief and reconstruction for more than ten years. Now all its major objectives are threatened by war; many of its activities have been disrupted for the time being. Gradually changing its emphasis to American health, the Fund has since 1918 appropriated for its main interests more than \$13,500,000 to the promotion of physical health; nearly \$7,000,000 for mental health, and for fellowships to bring British graduate students to American universities, \$3,250,000. Appropriations for the year ended Sept. 30, 1939, amounted to \$1,919,908.73, of which about two thirds was for the promotion of health through medical education, medical research, public health and the rural hospital program. To aid in the development of public health activities in Oklahoma, Alabama, Tennessee, Mississippi and Massachusetts, the Fund appropriated \$356,619.72. This appropriation also covered fellowships for physicians and nurses to study at Harvard, Tulane and Vanderbilt universities and at Tufts College. The rural hospital program sponsored by the Fund now includes ten hospitals completed, two in the planning or construction stage and one not built by the Fund but receiving cooperation. The appropriation for this division, \$491,606.67, includes not only construction but fellowships for physicians and hospital administrators at the University of Chicago and for hospital administrative personnel, support of a training course group are now so overloaded that plans are being made to enlarge them. Mental hygiene, a major preoccupation of this foundation from the beginning, claimed an appropriation of \$193,329. The Fund's method in this field at present is to encourage the interpretation of psychiatry and clinical medicine, primarily in the practice of psychiatry and clinical medicine, ships for graduate training and through establishment of clinical teaching facilities which bring a psychiatric point of view into the pediatric service. The Fund supports the development of psychiatry at the University of Louisville and the Committee for Mental Hygiene; a teaching clinic and psychiatric unit for children at the University of Minnesota; a new similar unit at Stanford University School of Medicine; and fellowships at various universities and hospitals. One of the casualties of the war is in this field. The London Child Guidance Clinic and Training Center, supported by the Fund, has closed for the duration of the war; the Child Guidance Council has moved its headquarters to Bath and taken up emergency duties in addition to its usual program. Fellowships granted to British students to study in the United States have also been interrupted in many cases and four American students who planned to study abroad have had to postpone the trip or transfer their work elsewhere. Few new grants for medical research were made, the report stated, the greater part of the funds available for this purpose having been pledged previously. The new ones included funds for two ultracentrifuges at Harvard University for the study of protein chemistry; studies of kidney function, chemical factors in resistance to disease and leukemia.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 13, 1940.

Food Rationing Begun

In this war, as in the last, the allies hold command of the sea. The submarine campaign has failed and the losses of ships from the strewing of the sea with mines are too small to affect commerce seriously. This ruthless procedure has caused more losses to neutrals than to the allied powers. Britain imports a large part of the food supply and there is plenty of shipping to bring it. But the war is a strain on the national resources. The importation of munitions on a large scale and the movement of troops limit the shipping which can be used for food. Moreover, millions of fighting men withdrawn from production have to be fed. It is not surprising that rationing of food has been introduced. The object is that all, rich or poor, shall be able to obtain sufficient food. There is plenty of food in the country, but some control is necessary in the case of a few favorite foods. Their rationing is only a small inconvenience, as there are plenty of alternatives. Only butter, bacon, ham and sugar have been rationed, but in February meat will be added to the list.

The weekly allowance of butter is only 4 ounces to a person, about half the normal consumption. But this is not important nutritionally, as all other fats are unrestricted and there is an excellent margarine, indistinguishable from butter and containing vitamins. The weekly allowance of bacon or ham is also 4 ounces. This again is unimportant, as there are so many alternatives. The allowance of sugar is 12 ounces a week. Syrup, treacle, jam and confections are not rationed. Meat will be rationed not by quantity but by price, the weekly allowance being 36 cents. This restriction does not affect nutrition, as there are many unrationed sources of protein—fish, poultry, game, milk and cheese. Moreover, the edible offals—liver, kidney, sweetbreads—are unrationed. A main cause for this mild rationing is that the government has decided that the fighting services must be better fed than civilians are in time of peace.

The Pelvic Osteo-Arthropathy of Pregnancy

Loosening of the pelvic joints in pregnancy to facilitate labor is an observation which goes back to Hippocrates, but it has generally been regarded as only physiologic, though Joel E. Goldthwait (*THE JOURNAL*, Aug. 31, 1907, p. 768) and others drew attention to the frequent part played by softening of the sacro-iliac joints in the production of the backache of pregnancy. To the Section of Obstetrics and Gynecology of the Royal Society of Medicine, Prof. James Young made a communication based on forty-two cases of pelvic osteo-arthritis in pregnancy, of which thirty-four occurred in a series of 4,512 pregnant women (0.75 per cent). The symptoms were pain and tenderness in the sacro-iliac and pubic regions coming on during pregnancy and aggravated by walking, which was often difficult and in seven cases impossible. There was frequently a limp or waddle in the gait. In some cases the pain and tenderness were located in one sacro-iliac joint. In cases of severe locomotor difficulty there were often pain and tenderness along the line of the adductor muscles of the thigh. A number of patients dated the symptoms from some trauma, which might be trivial, such as a slip or a fall. In one case bending down to tie a shoe lace was immediately followed by acute symptoms. In thirty-three cases the time of onset of the symptoms was recorded. In thirty-two they arose during

pregnancy and in one ten days after delivery, when the patient got out of bed. The average time of onset was the twenty-sixth week of pregnancy, the earliest the eighth week and the latest the thirty-sixth. Thirteen of the patients were primiparas.

Professor Young could not find that the symptoms bore any relation to the increase of pubic separation, as other workers have suggested. Many cases with severe symptoms showed no greater widening than is found ordinarily in pregnancy without symptoms. But when pubic symptoms were severe a gliding movement could easily be detected at the joint when grasped between a finger in the vagina and the thumb over the symphysis, and the patient was asked first to stand on one foot and then on the other.

Why does a condition which must be regarded as essentially physiologic sometimes pass over into the pathologic? In five of the thirty-four cases there was a definite relation to a minor accident. Lowered tone of the muscles supporting the joints may in some cases render them liable to damage. It may be significant that fifteen of the thirty-four women suffered from associated conditions such as toxemia and pyelitis. The alteration of the spinal curves consequent on the passing forward of the center of gravity of the body because of the enlarging uterus transmits the body weight along new lines and may create stresses in the pelvic joints and muscles. Finally, an endocrine origin is given for the softening of the pelvic joints.

The treatment in mild cases is the provision of a strong abdominopelvic belt and restricted exercise. In more severe cases rest in bed for from one to three weeks may give so much relief as to make walking comfortable with the support of the belt. In the worst cases complete rest in bed till delivery is necessary. In such the hammock, as used for the treatment of fractured pelvis, is of great value. These women cannot tolerate the gentlest movement in bed, as in placing the bedpan. After delivery the treatment varies with the case. In mild cases the symptoms disappear in the ordinary lying-in period. In severer cases rest in bed for two or three weeks may be required, followed by a supporting belt for several months. In the worst cases the hammock should be continued for at least a month and possibly for several months.

OSLO

(From a Special Correspondent)

Jan. 3, 1940.

The Problem of Induced Abortions

In the lay as well as in the medical press during the last few years, the discussion of the ethics of induced abortions seems to have been fruitless. At any rate no concrete measure for the reform of existing legislation has emerged. And the fanatics at both extremes have been most successful in exasperating the man in the street as well as each other. A study of the problem was presented last autumn to the Norwegian Medical Society by Dr. Johan Haffner, who is attached to Akers Hospital, Oslo. Part of it concerns facts, part proposals.

In the Akers Hospital in the seven year period 1932-1938, 970 cases of abortion were dealt with. Seventy-nine per cent of the women were married, and more than three fourths of these married women had already given birth to one child or more. Only in 3.2 per cent of the total was the age of the patient under 20, all of which data go to invalidate the popular fallacy that the criminal induction of abortion is mainly the concern of irresponsible, juvenile, unmarried women. Sixty per cent of these abortions were afebrile. There were fifteen deaths, an average of two a year. Dr. Haffner calculated that in the public hospitals alone some seven or eight women die every year in Oslo of abortion. In as many as eighty-three of the 131 cases in which the induction of abortion was confessed to, a catheter had been employed, usually by the woman herself.

Dr. Haffner would stop the trouble at its source, i. e. by the teaching of birth control by competent persons. He suggests that, before discharge from hospital, every patient who has been treated for abortion should be given instructions as to how to prevent pregnancy in the future. The pornographic and usurious conditions under which catheters and allied devices are hawked round to the public should be stamped out by the authorities, who should themselves provide the advice and other help needed by so many women in these circumstances. It is gratifying to note that prosecutions have already been instituted against the worst offenders in this field.

At a recent meeting in Oslo of the Norwegian Medical Society, a resolution was adopted to the effect that this society sees in the illegal interruption of pregnancy a medical problem which is serious. The resolution proceeds: "As a contribution to the campaign against this evil, the society recommends that the number of health centers for maternity and child welfare be increased and their activities extended to the teaching of the physiology of sex and of contraception so that this too comes under medical control. The society also finds that both humane and medical considerations indicate an extension of legal opportunities for interrupting pregnancy when there are cogent arguments for doing so." This resolution is the more important as the Norwegian Medical Society is fairly representative of the whole of the Norwegian medical profession, although less than half of the doctors in Norway are members of this society.

ITALY

(From Our Regular Correspondent)

Dec. 30, 1939.

A New Law Affecting Servants

A law was recently made by which persons suffering from infections of a contagious nature are not allowed to enter the domestic service. All servants must pass medical examinations, which are free of charge and which will be repeated at specified intervals. The results of the examinations will be kept in special records. The penalty for infraction of the law, both patrons and servants, is a fine up to 500 lire (\$25).

Lecture on Venereal Lymphogranuloma

Prof. A. Midana, of Turin, in a lecture before the Società di gastro-enterologia of that city, discussed venereal lymphogranuloma. All varieties of the anorectocolonic form, which is the most frequent, should be grouped under the name of infiltrating rectitis. Often the rectal lesions progress to the lower segments of the large intestine. It is possible that certain forms of colonic diseases which are diagnosed as ulcerous colitis are forms of inguinal lymphogranuloma with extension to the colon. The formation of fistulas is a grave complication. The pathogenesis of the condition is unknown. The various theories agree that inoculation of the rectal walls takes place either directly through the mucosa or through the neighboring lymphatic regions. The development of either the hypertrophic or the stenotic form of the disease depends on the mechanism by which contagion takes place, which in turn depends on the sex of the patient.

Test for Liver and Renal Functions

Prof. E. Macchia, of Naples University, in a lecture before the Accademia medica di Naples, reported a simple technic for determination of indole in the blood as a test for liver and renal functions. An intravenous injection of a 2 per thousand indole solution is slowly administered to patients during fasting. The solution is prepared in physiologic solution of sodium chloride. The dose is 1 cc. of the solution for each 6 Kg. of body weight. Blood for determining indole is taken ten minutes after the injection and again 120 minutes after it. The first blood is withdrawn for diagnosis of the detoxicating functions

of the liver, the second one for diagnosis of the emunctory functions of the kidneys. The amount of indole in the blood serum of the first sample of blood varies between 0.15 and 0.2 mg. for each thousand cubic centimeters of blood if the detoxicating functions of the liver are normal. The figures are higher if the functions of the liver are poor. The amount of indican in the blood of the second sample varies between 1.4 and 1.5 mg. for each thousand cubic centimeters of blood if the emunctory functions of the kidney are good. The more acute the emunctory dysfunctions of the kidney, the higher the figures of indicanemia. The test is reliable. The amount of indole in the blood of patients who are suffering from renal diseases or uricacidemia is normal after indole loading, whereas it is increased in patients with liver detoxicating dysfunction.

Treatment of Malaria

Professor Pansini reported to the Accademia della scienza mediche e chirurgiche, of Naples, the results of different treatments in more than 3,000 cases of benign malaria in Italians coming home from Africa. The different treatments used in various groups of patients were epinephrine, atabrine, quinine and antimony tartrate. He concluded that the evolution of malaria can be favorably modified by any of the various treatments which are commonly employed.

No treatment, either alone or in association with another, controls malaria unless a certain time elapses and immunity develops. Radical changes in the environment and living habits of the patients, such as change of climate, rest and adequate food, are important factors in accelerating the establishment of immunity in malaria. Quinine has specific action in controlling the attack but does not prevent malarial recurrences. When the drug is administered over a long period, reappearance of malaria is prevented. However, attacks frequently reappear after discontinuation of the drug. The speaker believes that quinine has a specific biologic action by which the pyretogenic properties of plasmodia are neutralized. Atabrine prevents recurrences for longer periods than those induced by quinine. Epinephrine neither prevents nor prolongs the intervals between attacks. Sometimes the attacks take place more often during epinephrine treatment than before it. The effects of epinephrine are better when it is administered in association with other drugs than when given alone. The results of the antimony or potassium tartrate treatment are inconstant. The alternating administration of some drugs of antimalarial value gives satisfactory results.

Marriages

MYERS BOWMAN DEEMS, Huntington, Ind., to Miss Florence Esther Woods, of Evansville, in Orlando, Fla., Dec. 28, 1939.

JOSEPH JAMES SOFRANEC JR., Youngstown, Ohio, to Miss Jean Louise Lumppp, of Sharon, Pa., in New Orleans, January 6.

JULIAN KENNETH WELCH JR., Memphis, Tenn., to Miss E. Lucille Mount, of Trezevant, Tenn., Dec. 17, 1939.

ROBERT LEE ROBINSON, Mars Hill, N. C., to Miss Sara Hel Willingham, of Atlanta, Ga., in December 1939.

KENT A. DEWEY, Grand Rapids, Mich., to Miss Margaret McGregor, of Lynnville, Tenn., Dec. 24, 1939.

CHARLES BARRETT KENNEDY to DR. REBECCA STUDDWRIGHT, both of New Orleans, Dec. 20, 1939.

OSCAR EDGEWORTH BLOCH JR. to Miss Jean Russell, both of Louisville, Ky., in December 1939.

LELAND H. DAME to Miss Mary Lee Price, both of West Palm Beach, Fla., Dec. 25, 1939.

GEORGE R. O'DANIEL to Miss Esther Cordell, both of Hartsville, S. C., Dec. 20, 1939.

JOSEPH M. RUDA to Miss Florence Rudzinski, both of Chicago, Nov. 23, 1939.

S. CHARLES FREED to Miss Shirley Kolinsky, both of Chicago, February 11.

Deaths

Frank Hicks Walke ☉ Shreveport, La.; Baltimore Medical College, 1912; formerly secretary of the Shreveport Caddo Parish Medical Society; for many years secretary-treasurer of the Tri-State Medical Association (Texas, Arkansas, Louisiana); member of the parish school board; held a commission in the U. S. Navy and was a member of the medical advisory board during the World War; at one time parish health officer; was physician in chief to the Home for the Aged; for many years federal jail physician; member of the staffs of the Highland Sanitarium, Schumpert Memorial Sanitarium and the Pines Sanatorium; member of the board of trustees of Dodd College; aged 53; died, Dec. 21, 1939.

John Francis Condon ☉ Newark, N. J.; Long Island College Hospital, Brooklyn, 1901; past president of the Essex County Medical Society; member of the state board of medical examiners; fellow of the American College of Surgeons; attending gynecologist to the Essex County Isolation Hospital, Belleville; chief, department of obstetrics and gynecology and medical director, St. James Hospital; attending obstetrician to the Newark City Hospital, consulting obstetrician to the Irvington (N. J.) General Hospital, Hospital of St. Barnabas and for Women and Children, Presbyterian Hospital, Newark and St. Mary's Hospital, Orange; aged 67; died, Dec. 8, 1939, of coronary thrombosis.

Carl Richard Keppler, Newark, N. J.; Columbia University College of Physicians and Surgeons, New York, 1898; member of the Medical Society of New Jersey; formerly professor of orthopedics at the Fordham University School of Medicine, New York; served at various times and in different capacities on the staffs of the Yorkville Hospital, Harlem Hospital, Sydenham Hospital and the Fordham Hospital, New York; St. Elizabeth's Hospital, Elizabeth, and Somerset Hospital, Somerville; aged 62; died, Dec. 27, 1939, of cerebral hemorrhage.

Alfred Bielschowsky ☉ Hanover, N. H.; Universität Leipzig Medizinische Fakultät, Saxony, Germany, 1894; professor of ophthalmology at Dartmouth Medical School; formerly professor of ophthalmology at the University of Breslau, Germany, and member of the faculties of the Universities of Marburg and Leipzig; member of the New England Ophthalmological Society; director of the Dartmouth Eye Institute; aged 68; died, January 6, at the Jewish Hospital, Brooklyn, following an operation for brain tumor.

Seneca Egbert ☉ Wayne, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; emeritus professor since 1932 and professor of hygiene from 1916 to 1931 at his alma mater; professor of hygiene from 1893 to 1916 and dean from 1898 to 1916, Medico-Chirurgical College of Philadelphia; professor of hygiene, Temple University School of Medicine, Philadelphia, from 1896 to 1899; author of "A Manual of Hygiene and Sanitation" published in eight editions and "Personal Hygiene for Nurses"; aged 76; died, Dec. 6, 1939.

Le Roi Goddard Crandon ☉ Boston; Harvard Medical School, Boston, 1898; fellow of the American College of Surgeons; instructor of surgery at his alma mater from 1903 to 1918; on the staffs of the Whidden Memorial Hospital, Everett, Chelsea (Mass.) Memorial Hospital and the Home Memorial Hospital, New London, Conn.; author of "Surgical After-Treatment" published in 1911; aged 66; died, Dec. 27, 1939.

James Douglas Crane ☉ Ishpeming, Mich.; College of Physicians and Surgeons, Baltimore, 1914; past president of the Marquette-Alger Counties Medical Society; fellow of the American College of Surgeons; served during the World War; on the staff of the Ishpeming Hospital; aged 47; died, Dec. 18, 1939, in the Columbia Hospital, Milwaukee, of coronary disease and chronic hypertension.

Roy Ernest Mitchell ☉ Eau Claire, Wis.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1901; member of the American Psychiatric Association; past president and secretary of the Eau Claire and Associated Counties Medical Society; on the staff of the Luther Hospital; aged 63; died, Dec. 12, 1939, of coronary occlusion.

Ernest Mitchell Fuqua, Pulaski, Tenn.; Vanderbilt University School of Medicine, Nashville, 1911; member of the Tennessee State Medical Association; served during the World War; at one time superintendent of the Protestant Hospital, Nashville; member of the state board of health; aged 58; died, Dec. 31, 1939, in St. Thomas Hospital, Nashville.

Kenneth Cameron, Westmount, Que., Canada; McGill University Faculty of Medicine, Montreal, 1887; fellow of the American College of Surgeons; served during the World War; formerly lecturer in clinical surgery at his alma mater; on the staff of the Montreal General Hospital for many years; aged 76; died, Dec. 25, 1939, of heart disease.

George McClellan Liston ☉ Baldwin City, Kan.; Medical College of Indiana, Indianapolis, 1892; Hospital College of Medicine, Louisville, Ky., 1896; past president of the Douglas County Medical Society; aged 75; died, Dec. 18, 1939, in the University of Kansas Hospital, Kansas City, of prostatic hypertrophy and heart disease.

Edson Elisha Gadd ☉ Des Moines, Iowa; Eclectic Medical Institute, Cincinnati, 1897; Bennett College of Eclectic Medicine and Surgery, Chicago, 1903; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; aged 70; died, Dec. 9, 1939, of coronary thrombosis.

Francois Louis Demers, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1909; formerly member of the city council and member of the medical staff of the city health department; served during the World War; aged 57; died, Dec. 26, 1939.

Todd Caris, Mount Gilead, Ohio; Starling Medical College, Columbus, 1895; member of the Ohio State Medical Association; for many years county coroner; secretary of the Morrow County Medical Society; served during the World War; aged 68; died, Dec. 28, 1939, in the Marion (Ohio) City Hospital of myocarditis.

Arthur Henry Domann ☉ Orange, Calif.; College of Physicians and Surgeons, medical department of the University of Southern California, Los Angeles, 1911; fellow of the American College of Surgeons; on the staffs of the Orange County Hospital and St. Joseph Hospital; aged 60; died, Dec. 11, 1939.

Thomas Vincent McLaughlin, Wilkes-Barre, Pa.; Medico-Chirurgical College of Philadelphia, 1906; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 60; for many years on the staff of the Mercy Hospital, where he died, Dec. 10, 1939.

William Rado ☉ Newark, N. J.; Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultasa, Budapest, Hungary, 1918; member of the National Gastrological Association; aged 46; died, Dec. 30, 1939, in the Beth Israel Hospital of gangrenous appendicitis.

Robert Ferguson, West Hartford, Conn.; Yale University School of Medicine, New Haven, 1903; fellow of the American College of Surgeons; formerly on the staff of the Copper Queen Hospital, Bisbee, Ariz.; aged 64; died, Dec. 12, 1939, of coronary embolism.

George E. Kerr ☉ Chattanooga, Okla.; Detroit College of Medicine, 1894; past president of the Comanche County Medical Society; aged 72; died, Dec. 25, 1939, in the Wichita General Hospital, Wichita Falls, Texas, of heart disease and bronchopneumonia.

James Thomas Breedlove, St. Louis; Meharry Medical College, Nashville, Tenn., 1912; aged 61; on the staffs of St. Mary's Infirmary, Homer G. Phillips Hospital and the Peoples Hospital, where he died, Dec. 31, 1939, of pneumonia and ruptured appendix.

Frank Laird Kennedy, Camden, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1928; for many years on the staff of the West Jersey Homeopathic Hospital; aged 35; died, Dec. 3, 1939, in the Hahnemann Hospital of typhoid.

John Krupp Hedrick, Telford, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1898; for many years president of the board of health, and secretary of the board of education; aged 69; died, Dec. 12, 1939, of cerebral hemorrhage.

James Madison Hamilton, Los Angeles; University of Vermont College of Medicine, Burlington, 1893; member of the Vermont State Medical Society; served during the Spanish-American and World wars; aged 71; died, Dec. 10, 1939.

Mathew Earl O'Keefe ☉ Council Bluffs, Iowa; John A. Creighton Medical College, Omaha, 1906; fellow of the American College of Surgeons; on the staff of the Mercy Hospital; aged 58; died, Dec. 6, 1939, of coronary thrombosis.

Don Rhodolph Flower, Park Falls, Wis.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1894; for many years member of the Park Falls city council, and health officer; aged 88; died, Nov. 14, 1939, of senility.

DEATHS

JOUR. A. M. A.
Feb. 17, 1939

- Clarence Henderson**, Lind, Wash.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; for many years member of the University and health officer; aged 70; died, Dec. 1, 1939.
- Alice Rogers Easby**, Media, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1884; member of the Medical Society of the State of Pennsylvania; aged 79; died, Dec. 29, 1939, of arteriosclerosis and heart disease.
- Thomas Fulton McConaghie**, Oakdale, Ill.; St. Louis University School of Medicine, 1904; member of the Illinois State Medical Society; aged 67; died, Dec. 29, 1939, in St. Mary's Hospital, Centralia, of pneumonia.
- Theodore Henry Wheeler**, Los Angeles; Eclectic Medical College of Indiana, Indianapolis, 1903; Central College of Physicians and Surgeons, Indianapolis, 1904; served during the World War; aged 69; died, Nov. 22, 1939.
- Joseph Johnson Waller**, Oliver Springs, Tenn.; Southern Medical College, Atlanta, Ga., 1892; member of the Tennessee State Medical Association; aged 72; died, Dec. 8, 1939, of coronary thrombosis and hypertension.
- James McCrea** Ⓢ Fulda, Minn.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1894; past president of the Murray County Medical Society; aged 76; died, Dec. 19, 1939, of carcinoma of the rectum.
- George William Krick**, West Pittston, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1913; served during the World War; aged 50; died, Dec. 17, 1939, in the Homeopathic Hospital, Reading.
- Charles Edward Fawcett** Ⓢ Stewartville, Minn.; Northwestern University Medical School, Chicago, 1893; bank president and president of the school board; aged 70; died, Dec. 8, 1939, of coronary thrombosis.
- Ephraim W. Bogardus**, Geneva, N. Y.; University of Buffalo School of Medicine, 1883; member of the Medical Society of the State of New York; aged 86; died, Dec. 17, 1939, of chronic myocarditis.
- James Otis Carrington**, Darby, Pa.; Howard University College of Medicine, Washington, D. C., 1913; on the staff of the Mercy Hospital, Philadelphia; aged 56; died, Dec. 2, 1939, of coronary occlusion.
- Philip Aloysius Lonergan**, Dickson, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1909; served during the World War; aged 54; died, Dec. 16, 1939, of heart disease.
- James Aloysius Mulligan**, Union City, N. J.; Atlantic Medical College, Baltimore, 1909; aged 60; died, Dec. 7, 1939, in St. Mary's Hospital, Hoboken, of arteriosclerosis and heart disease.
- Walter J. Dickson**, Nashville, Ga.; Atlanta College of Physicians and Surgeons, 1906; county physician; member of the school board; aged 61; died, Dec. 21, 1939, of typhus fever.
- Vernon Voorhees Rood**, Grass Valley, Calif.; College of Physicians and Surgeons, Los Angeles, 1916; member of the California Medical Association; aged 60; died, Nov. 16, 1939.
- John Fred Yonkman**, Grand Rapids, Mich.; University of Michigan Medical School, Ann Arbor, 1923; served during the World War; aged 45; died, Dec. 14, 1939, of brain tumor.
- Gisle Bjornstad**, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1894; aged 72; died, Dec. 29, 1939, of hypertension and coronary disease.
- Francis Howard Finley**, Finleyville, Pa.; College of Physicians and Surgeons, Baltimore, 1895; bank president; aged 68; died, Dec. 25, 1939, of bronchopneumonia.
- James Persinger McNeil** Ⓢ Kingsport, Tenn.; Vanderbilt University School of Medicine, Nashville, 1919; aged 44; died, Dec. 24, 1939, of acute monocytic leukemia.
- Edward Ayers Johnston**, Minneapolis; Hahnemann Medical College and Hospital, Chicago, 1903; aged 70; died, Dec. 30, 1939, of carcinoma of the prostate.
- Horace Clare Peabody**, Sisseton, S. D.; Chicago College of Medicine and Surgery, 1916; aged 55; died, Dec. 14, 1939, in a hospital at Webster of heart disease.
- Benjamin Franklin Barnes**, Elm City, N. C.; University of Maryland School of Medicine, Baltimore, 1902; aged 62; died, Dec. 31, 1939, of cerebral hemorrhage.
- John W. Little**, Westerville, Ohio; Starling Medical College, Columbus, 1881; aged 80; died, Dec. 29, 1939, of chronic nephritis, arteriosclerosis and influenza.
- William S. Parks**, Wapello, Iowa; State University of Iowa College of Medicine, Iowa City, 1885; aged 80; died, Dec. 10, 1939, of coronary thrombosis.
- George Nathaniel Plummer Mead** Ⓢ Winchester, Mass.; Harvard Medical School, Boston, 1886; aged 80; died, Dec. 14, 1939, of coronary heart disease.
- Olin Carl Diehl**, Diller, Neb.; John A. Creighton Medical College, Omaha, 1902; aged 67; died, Dec. 20, 1939, of injuries received in an automobile accident.
- William F. Justus**, Rushville, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1892; county coroner; aged 71; died, Dec. 27, 1939, of myocarditis.
- Elmer Ellsworth Faulkner**, Minneapolis; Hahnemann Medical College and Hospital, Chicago, 1889; aged 78; died, Dec. 4, 1939, of coronary sclerosis.
- Ramon Roca**, San Jose, Calif.; Universidad de Barcelona Facultad de Medicina, Spain, 1889; aged 76; died, Nov. 12, 1939, of carcinoma of the prostate.
- Beverly Washington Hall**, Mountville, Ga.; University of Georgia Medical Department, Augusta, 1891; aged 74; died, Dec. 10, 1939, of heart disease.
- Elihu Culbertson**, Savannah, Ohio; University of Wooster Medical Department, Cleveland, 1880; aged 83; died, Dec. 21, 1939, of cerebral hemorrhage.
- Harry Wadsworth Slack**, Corsica, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1895; aged 70; died, Dec. 9, 1939, of hernia.
- Manley Blevins**, Warrensville, N. C. (licensed in North Carolina in 1885); aged 80; died, Dec. 9, 1939, of perforated ulcer of the stomach.
- James Rufus Speight**, Robbinsville, N. C.; Medical College of Virginia, Richmond, 1890; aged 73; died, Dec. 14, 1939, of cerebral hemorrhage.
- Benjamin Edward Robinson**, Boston; Leonard Medical School, Raleigh, N. C., 1904; aged 60; died, Nov. 26, 1939, of coronary thrombosis.
- Henry Bell Pratt**, Yakima, Wash.; Syracuse University College of Medicine, 1903; aged 63; died, Dec. 22, 1939, of coronary thrombosis.
- Samuel Clark Russwurm**, Hughes, Ark.; Memphis (Tenn.) Hospital Medical College, 1899; aged 70; died, Dec. 21, 1939, of coronary thrombosis.
- Samuel H. Reynolds**, Maplewood, Mo.; Barnes Medical College, St. Louis, 1897; aged 70; died, Dec. 15, 1939, of chronic myocarditis.
- John Aloysius Lotz**, St. Louis; St. Louis University School of Medicine, 1906; aged 62; died, Dec. 26, 1939, of coronary disease.
- Colin Henry Ross**, Omaha; Omaha Medical College, 1893; aged 76; died, Dec. 17, 1939, in Chattanooga, Tenn., of bronchopneumonia.
- Clark Lee Shipley**, Paris, Ill.; St. Louis College of Physicians and Surgeons, 1908; aged 57; died, Dec. 24, 1939, of hemiplegia.
- Franklin P. Hulén**, Wichita, Kan.; Missouri Medical College, St. Louis, 1885; aged 82; died, Dec. 20, 1939, of cardiac renal disease.
- Alvin Barnard Cary**, Donnellson, Ill.; Marion-Sims College of Medicine, St. Louis, 1899; aged 63; died, Dec. 27, 1939, of heart disease.
- W. T. Green**, Dayton, Tenn.; Chattanooga Medical College, 1892; aged 77; died in December 1939 of chronic myocarditis and nephritis.
- William Heitmann**, Nashotah, Wis.; Milwaukee Medical College, 1902; aged 64; died, Dec. 17, 1939, of cerebral hemorrhage.
- John W. Myers**, Glen Dale, W. Va.; College of Physicians and Surgeons, Baltimore, 1893; aged 68; died, Dec. 19, 1939, of pneumonia.
- Samuel E. Embry**, Chicago; Louisville (Ky.) Medical College, 1891; aged 82; died, Dec. 26, 1939, of fracture of the femur.
- Joseph Hoffmaster Campbell**, Rutledge, Tenn. (licensed in Tennessee in 1889); aged 81; died, Dec. 9, 1939, of angina pectoris.
- Alexander G. Low**, Hartwood, Va.; Chicago Homeopathic Medical College, 1899; aged 76; died, Dec. 3, 1939, of angina pectoris.
- Maskel Lee**, Atlanta, Ill.; Rush Medical College, Chicago, 1888; aged 84; died, Dec. 20, 1939, of heart disease.
- J. P. Joyce**, Lexington, Tenn. (licensed in Tennessee in 1889); aged 74; died, Dec. 27, 1939.

Correspondence

EFFECT OF BASIC SCIENCE LAWS

To the Editor:—The so-called basic science law was, I believe, originally intended to curb the osteopath and the chiropractor. As it operates at present, it is curbing the medical profession effectively as well. The basic science law in most states requires examination in five or six subjects. Each subject represents one year's work in that subject. It is obvious that adequate preparation for such an examination in the case of a man who has been out of school a goodly number of years is a large order. As a rule there is no reciprocity on the basic science examination, and this, together with the fact that examinations are held at comparatively long intervals, makes it an effective bar when registration is attempted.

No one will hold a location open long enough to complete a deal under these circumstances, and even for recent graduates it adds a definite degree of uncertainty. In their efforts to be fair, most boards feel that they can make no exception in favor of the medical profession, although the law was intended primarily for the nonmedical cults.

As it stands at present, it constitutes a Chinese wall for the average man who is not a recent graduate.

PAUL R. HOWARD, M.D., Oak Park, Ill.

[The letter was referred to the office of the Bureau of Legal Medicine and Legislation, which replies:]

To the Editor:—Basic science laws have never been advocated as an ideal type of legislation. They do, however, represent the most practical approach to a solution of the muddle in which medical licensure has been permitted to flounder in many of the states. A few years ago this bureau undertook to find out the views on basic science laws of state medical associations of those states in which a basic science requirement had been imposed on all applicants for licenses to practice the healing art. There was a surprising absence of complaint against such laws received from such associations. As a matter of fact, during the last fifteen years few criticisms of the principles underlying basic science laws have reached this bureau.

The burden of the grievance against basic science laws seems to be that they interfere with the customary reciprocal relations that normally exist between states in the matter of medical licensure. Generally speaking there should be no such interference. The draft of a uniform basic science act prepared by this bureau was so framed as to avoid just that result. It provides for exemption from the basic science examination of any person who submits to the basic science examining board satisfactory proof showing:

(1) that the applicant has passed in another state an examination in the basic sciences either before a board of examiners in the basic sciences or before a state board authorized to issue licenses to practice the healing art;

(2) that the requirements of that state are not less than those required by this act as a condition precedent to the issuance of a license; and

(3) that the board of examiners in the basic sciences in that state grant like exemption from examination in the basic sciences to persons holding certificates from the state board of examiners in the basic sciences of . . . or holding licenses to practice the healing art according to the method or school that the applicant proposes to follow, issued after examination by the proper license board of . . .

While there is some variance in the phraseology used in the reciprocity provisions in the several basic science acts that have been enacted, all but three (Arizona, Florida and Washington) do authorize the respective basic science examining boards to give credit to examinations passed by the applicant in the basic sciences in other states. In Arkansas, for example, the reciprocity provisions in the law follow closely the provisions incorporated in our uniform draft. While the Arkansas act does not make it mandatory that the board grant exemption from examination to licentiates from other states, having proper qualifications, it does lodge with the board a discretionary right to do so. For instance, Arkansas, in 1938 115 applicants were

granted basic science certificates, of which forty-three were issued without examination or were so-called reciprocity certificates. In Iowa, as another example, 115 certificates were issued during that year, seventy without examinations. In the District of Columbia, forty-six certificates were issued during 1938, twenty-two being without examination. In all the states having a basic science law in operation during 1938, a total of 1,388 certificates were issued, 293 of which were without examination. These figures were published in *THE JOURNAL* April 29, 1939, page 1724. Corresponding figures for 1939 will be published in the State Board Number of *THE JOURNAL* for this year. During 1938, however, no reciprocity certificates were issued in four states (Arizona, Connecticut, Oklahoma and Washington). In only two of these states, however, was the failure to issue so-called reciprocity certificates due to the fact that the laws contained no provision therefor, those states being Arizona and Washington. Some difficulties have arisen in connection with the enforcement of the Arkansas basic science act, but most of these difficulties were cleared up by a recent decision of the Supreme Court of Arkansas.

There have been several instances in the past in which complaints have been voiced against basic science legislation on the ground of interference with reciprocal relations between the states. These instances have been rare and in many of them an investigation has disclosed the fact that the alleged interference was due not to any fault in the legislation itself but to administrative practices.

Dr. Howard refers to the fact that there are comparatively long intervals between examinations in basic science and that this works a hardship on applicants. In this connection, if he has in mind Arkansas, the act does not specify the dates on which examinations are to be held. It provides merely that "the board shall conduct examinations at such times and places as it deems best, having due regard to the times and places of the examinations held by the several professional examining boards authorized to issue licenses to practice the healing art in the state of Arkansas."

BUREAU OF LEGAL MEDICINE AND LEGISLATION
OF THE AMERICAN MEDICAL ASSOCIATION.

LIPOCAIC AND PANCREATIC EXTRACTS

To the Editor:—I was much interested in the article in *THE JOURNAL* January 6 by Dragstedt in which he calls attention to a substance present in the pancreas which he calls lipocaic. It might be of some aid to those interested in the subject of diabetes and disturbances of fat metabolism, as well as atherosclerosis, to know that a number of our men have been using the pancreatic extract described by Dr. Wolfe, of Philadelphia, and his co-workers, in cases of angina pectoris and diabetic gangrene, with most encouraging results. For this reason I feel that we should call to the attention of the profession that work on hormones of the pancreas, other than insulin, has been done by the Wolfe group at Temple University. There is a rich bibliography to which the Dragstedt group fails to refer.

Is Dr. Dragstedt's preparation much different from the one described by Dr. Wolfe or is it possible that he just overlooked it? In one of the recent articles, "Pancreatic Extract (Enzyme Free) in the Treatment of Diabetic and Arteriosclerotic Gangrene" (*Am. J. Surg.* 43:109 [Jan.] 1939) Dr. Wolfe says: "The active substance present in the enzyme-free pancreatic extract, which is neither histamine nor choline, exerts a beneficial influence upon lipid metabolism as well as on muscle metabolism in general. As a corollary to this, it may be that the combination of insulin, pancreatic extract and a diet low in fats will prevent the early appearance of atherosclerosis in diabetes, etc."

The same group showed that their substance, prepared in a similar fashion to that of Dragstedt, had fat influencing proper-

ties, before the International Congress in Rome in 1932, and in Leningrad in 1935. The first publication in reference to the extract appeared in the *Transactions of the American Therapeutic Society* for January 1931. Following this, one appeared in the *Annals of Internal Medicine* for November 1931. Some of the work was published in the *Archives internationales de pharmacodynamie et de therapie* 44:387 (March 15) 1933.

The Wolffe group also exhibited their work at the 1937 meeting of the New Jersey State Medical Society. An abstract of the presentation was published in 1938.

BARNEY LIHN, M.D., Vineland, N. J.

[NOTE.—This letter was referred to Dr. Dragstedt, who replies:]

To the Editor:—The papers of Dr. Wolffe have been for the most part published in obscure medical journals which it has been difficult for me to obtain. Through the courtesy of the American Medical Association Library I have secured a copy of the *Proceedings of the Fifteenth International Physiological Congress*, which was held in Leningrad in 1935 and which contains the abstract of a paper by Dr. Wolffe and his associates entitled "Desympatone—A Fraction of Insulin-Free Pancreatic Extract." Apparently Dr. Wolffe has secured an extract from pancreas which when injected intravenously into rabbits and dogs produces a definite but transitory fall in blood pressure and which in some way seems to antagonize the pressor action of epinephrine. I have been unable to find in any of the publications of this group any evidence indicating that this extract resembles lipocain in its effect on the fatty infiltration in the liver of depancreatized dogs or on fat metabolism and transport in a general way.

It is my impression that Wolffe has been following up the work of Frey on the possible presence of what is called a circulatory hormone obtained in extracts of pancreas that are given by parenteral injection. I believe it still remains a question as to whether or not the depressor effects of such extracts are specific for the pancreas or whether they simply represent the well known depressor effects of tissue extracts in general when injected intravenously in experimental animals.

LESTER R. DRAGSTEDT, Chicago.

Professor of Surgery, University of Chicago.

To the Editor:—In 1936 I got in touch with Dr. Wolffe, after seeing the type of work he was doing with various fractions of pancreatic extract, and asked him to prepare an exhibit for the 1937 meeting of the New Jersey State Medical Society.

Dr. Wolffe and his colleagues showed conclusively that the pancreas contained hormones which differ from insulin. One they described as having an epinephrine neutralizing effect. This had previously been shown by a number of investigators, such as Frey and Kraut, Gley and Kisthinos, and Vaquez and his co-workers. Dr. Wolffe's group demonstrated modifications of the previously reported method of preparation of this particular fraction, its possible isolation and new methods for standardization. They gave due credit to the previous investigators.

In their exhibit they also showed that the pancreas contains a hormone which influences fat metabolism and which to the best of their knowledge had not been reported before. They called this substance lipolysin.

They showed that the continued administration of the epinephrine neutralizing fraction and the fat influencing fraction was a promising therapeutic agent for patients suffering from angina pectoris and intermittent claudication. They explained its actions by its power to neutralize epinephrine, to stabilize the autonomic system and by stimulating fat metabolism, thereby aiding muscle metabolism.

They reported a series of cases showing the beneficial effects obtained by the use of these two fractions in combination with

insulin in patients suffering from diabetes and atheromatosis. They urged the use of these materials from the pancreas for the relief of angina pectoris in patients suffering from diabetes, in gangrene seen in patients suffering from diabetes mellitus and in early cases of gangrene.

Dr. Wolffe and his co-workers brought with them a number of patients whom they had treated at Temple University Hospital and at the Wolffe Clinic and demonstrated the method of treatment.

I examined their exhibit very carefully and I was sufficiently impressed with the work to ask Dr. Wolffe to write a summary of the work presented. This was published in the *Journal of the New Jersey State Medical Society* in March 1938. They were also given an award for this exhibit.

In THE JOURNAL of January 6 I read Dr. Dragstedt's article with great interest. He approaches the same problem from a somewhat different point of view, but he confirms the work presented by Dr. Wolffe and his co-workers.

I am writing this letter in the spirit of fair play, as well as to point out that in reporting therapeutic advances each individual should refer to the work done by previous investigators. It would make it much easier for the general profession to follow these advances.

It is quite possible that Dragstedt and his co-workers are not acquainted with Dr. Wolffe's work, although they have quite an extensive bibliography.

ASHER YAGUDA, M.D., Newark, N. J.

SAFE TRANSPORT FOR THE UNCONSCIOUS PATIENT

To the Editor:—The missing link in the effective treatment of acute asphyxial accidents was forged a short time ago in an asphyxial emergency which took place between the state of New Jersey and the state of New York. It has heretofore been the common practice to treat the patient who has been suffocated at the site of the accident. The patient either recovers or dies "on location." This practice has been due to the fact that adequate facilities have not been available for the treatment of the patient en route from the site of the accident to the hospital. January 9 a call was received to attend a woman aged 35 residing in New Jersey who had suddenly become unconscious, whose respirations had failed and whose life was being maintained by a modified prone pressure Schafer technic. When I arrived at the site of the accident I rolled the patient over on her back and, after laryngoscopy, instituted intubation; oxygen and carbon dioxide were insufflated into the endotracheal tube under measured pressure. During the next five hours of artificial respiration by intermittent insufflation the patient was given a transfusion and the circulation was stimulated by hypodermic injections.

In the absence of a palpable radial and temporal pulse but with a regular apex beat of 100 a minute, the finger nails and ears being pink at the end of a total period of nine hours of artificial respiration, without any voluntary effort having taken place the patient was transported under endotracheal insufflation down narrow winding stairs, backed into an ambulance and, preceded by a police car, carried for a distance of some 15 miles, across the state line of New Jersey to a Manhattan medical center. She was removed from the ambulance, still under insufflation, to the hospital stretcher, taken up on the elevator and placed in the respirator under oxygen insufflation treatment. Auscultation of the heart on transfer to the respirator by the physician who had checked this observation before removal indicated that there had been no change in the circulation by reason of transportation. The patient survived approximately five hours in the respirator, the circulation finally failing and death ensuing.

Postmortem examination revealed cerebellar hemorrhage. Careful inspection of the respiratory tract revealed no evidence of trauma to the glottis or trachea and no emphysema or other evidence of air pressure in the lung tissue.

This case is believed to be of historical importance because it demonstrates the feasibility of transporting safely the patient who has ceased to breathe. Every profoundly asphyxiated patient and every patient exposed to unconsciousness and asphyxia during transportation is entitled to the benefit of the relatively simple technic demonstrated and successfully employed in this case. It is neither difficult nor costly to condition ambulances for the safe transportation of the unconscious patient.

PALUEL J. FLAGG, M.D., New York.

Director of Activities, Society for the
Prevention of Asphyxial Death, Inc.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DRY NOSE AND THROAT IN FLOUR WORKER

To the Editor:—A man aged 42, employed in a flour mill, has for many years had trouble with his nose and throat, which has been variously diagnosed as sinus trouble, catarrh and irritation from flour dust. It has taken the form of dryness in the nose and throat, and he is continually trying to clear his throat. He states he feels as though there are scabs on the superior surface of his soft palate and is continually hawking, in an effort to get these scabs off his palate, and claims he does spit out large, dry, scablike pieces of dried phlegm at times. When first seen, about one and a half years ago, he seemed to have a chronic rhinitis. This has cleared up under treatment. He was treated for some time by a specialist, was given five or six roentgen treatments and has had a course of vaccine. On examination now, his nose and throat are essentially normal except for a dry, glazed appearance of the mucosa, which is most marked on the posterior pharyngeal wall. All treatment has been without success. He does seem to get some comfort from the instillation of liquid petrolatum into his nose. I suggested the use of amniotin in oil as a spray and the patient used this for about three weeks but did not continue after his first supply ran out. I also suggested that he change his employment but this he is unable to do at present. Any suggestions you might be able to make as to treatment would be appreciated. M.D., Virginia.

ANSWER:—From the description of the case it is apparent that the nasal condition is partly due to continuous irritation of the flour dust. Since this man cannot change his employment at present, it is imperative that a course of therapy be given him at the office and some procedures outlined for him at home with the view to protecting the nasal and pharyngeal mucosa, promoting nasal function and improving the general health.

Nasal irrigation with warm physiologic solution of sodium chloride, with or without sodium bicarbonate, or a simple isotonic alkaline solution will cleanse the nasal fossae adequately. If the nasal secretion or crusts have an offensive odor, a solution of potassium permanganate 2 grains to the pint of warm water may be substituted for the warm saline solution and gently irrigated into the nasal fossae. The crusts will come out in the washing leaving the entire nasal mucosa free. An application of ichthammol N. F. (10 per cent in glycerin) or one of the iodine preparations (iodine 2 Gm., potassium iodide 8 Gm., glycerin 150 cc.) to the nasal mucosa will promote the circulation of blood. It is best to follow with a bland oil spray, such as camphor, menthol and petrolatum. The stimulating solutions should be changed every now and again, to further enhance the end results.

The patient should be given instruction in the use of some suitable rubber bulb or siphon appliance so that he would be able to irrigate his nose once or twice daily without any untoward effects toward his sinuses or middle ears, and to snuff up or apply with a cotton tipped applicator a stimulating preparation along the lines of the foregoing, and follow with a spray of liquid petrolatum.

His general health should be built up to the highest possible level; the diet to consist of abundance of greens, fruits, vitamins, minerals, proteins and the like; any faults of systemic nature to be corrected and colds to be combated.

If any of the stimulating preparations are poorly tolerated or irritate unduly, they must immediately be discontinued and another substituted forthwith. Occasionally a mucosa will be found to be "sensitive" to one or more of the drugs, and because of this, it is best to abandon the use of such drugs for a time at least.

INDUSTRIAL OCCUPATION AND PREGNANCY

To the Editor:—What do you consider the best obstetric advice regarding working on the part of pregnant women, particularly in the textile industry, where there may be much reaching and pulling? Some state laws forbid pregnant women, after the fourth or fifth month, to work in any manufacturing business. Do you think it wiser to prohibit pregnant women, at any stage, to work in any industrial capacity and thus prevent the possibility of abortion and complications? Most of these women also have their own housework to do, besides working eight hours a day. Do you think this practice conducive to the good of the patient and the fetus? Isn't one purpose of modern antenatal care to warn against strenuous activity? Bernard S. Dignam, M.D., Thompsonville, Conn.

ANSWER:—No standard rules can be formulated as to the desirability of women continuing to work in industry during pregnancy. Economic factors must often carry considerable weight in any decisions in this regard. Certain general principles can be stated. Pregnant women should not continue their occupations if they are exposed to toxic hazards, particularly lead or other heavy metals. Pregnant women should not be subjected to an increased occupational hazard of infection. Occupations which subject women to excessive muscular efforts during which the intra-abdominal pressure is likely to be increased may be dangerous. Physical and mental efforts must not lead to exhaustion.

The moderate amount of physical exertion in the average occupation does not increase the hazards of pregnancy. Abortion is not increased in frequency. Normal pregnant women who have worked prior to the onset of gestation can usually continue their work until the beginning of the last trimester without harm to themselves. It is often desirable for a pregnant woman to be occupied in order to maintain a well balanced mental state.

TRAUMATIC MYDRIASIS

To the Editor:—A man was struck on the eye about one month ago by a hard object. There was no reaction at that time, with the exception of blurred vision in that eye. He came to see me one week later because of this condition. I could find nothing but a dilated pupil. This contracted with pilocarpine and his normal vision was restored. He has been under pilocarpine for three weeks because if he stops the drug for even one day the pupil dilates and, of course, his vision becomes blurred again. Would you please tell me the best procedure for a case of this type. I would also like to know the prognosis and treatment, if any. M.D., New Hampshire.

ANSWER:—Traumatic mydriasis is usually due to a slight rupture of the iris sphincter, which sometimes can be seen only with a corneal microscope. If the sphincter is ruptured, treatment is usually of no value except that a miotic can be used at any time when it is desired to contract the pupil. This would apply especially to exposure to bright sunlight. When the nerve supply to the sphincter is injured, which seems to occur occasionally, there is a tendency for the function of the pupil to become restored. Usually if restoration is to occur it will show some signs of doing this within three to six months.

FRACTURES OF NOSE

To the Editor:—What is the best first aid treatment of a fracture of the nose, either bone or cartilage? Jean S. Feldheym, M.D., San Francisco.

ANSWER:—The order of procedure is usually as follows: 1. Hemostasis. 2. Adequate cleansing of the parts. 3. Readjustment of the displaced tissues.

Hemostasis is accomplished by removing the initial clots from the nasal passages, gentle irrigation with sterile physiologic solution of sodium chloride and, if bleeding continues, the insertion of cotton plugs moistened with epinephrine. If the external parts are lacerated, bleeders should be sought for and clamped off. It is best not to use ligatures since buried catgut frequently favors secondary infection. Cleansing should be thorough by using a brush with soap and water. Foreign particles should be carefully removed. Fragments of bone which may be present in compound fractures should not be removed, since they frequently regain their vitality and therefore avoid the necessity of subsequent plastic procedures to restore the normal contour. Antitetanic serum should be given in all doubtful cases.

If seen early before much swelling has taken place the fractured bones and cartilages should be replaced immediately. This is done by combined intranasal and external manipulation. For

the former it is best to employ any smooth flat instrument such as a dull septum elevator, with which it is possible to elevate depressed or overriding fragments. (The Salinger fracture instrument has a grip handle which facilitates this maneuver.) At the same time the fingers of the other hand on the outside of the nose control the movement of the fragments and determine the resulting contour. If the nasal cartilages have been lacerated they should be accurately approximated with silk sutures placed closely enough together to prevent curling of the cut margins, which would result in a disfiguring scar. If, after reduction, the bony fragments tend to sink toward the nasal interior, they may be held in place by a light oil soaked pack wedged between the septum and nasal bones. If the nasal bridge tends to spread or deviate, it may be retained by a molded copper splint or a stent of dental modeling compound. Undue pressure must in all cases be avoided, since pressure necrosis of the skin is always a possibility.

If a case is seen at a time when swelling has already appeared to a degree which masks the deformity, repositioning of the fragments should be delayed two or three days until the application of cold compresses has reduced the swelling.

ABSORPTION OF LEAD AND ARSENIC THROUGH SKIN

To the Editor:—A man aged 25, an employee for several years of a local shoe factory, came to me in March 1933 complaining of blurring of vision. Central vision in his right eye was 0.2—1. In his left eye he counted fingers at 18 inches. On examination the eyes were completely normal externally. The fundi also were normal, except for questionable slight atrophy of the temporal half of the left disk, and perhaps slight engorgement of the retinal veins. The peripheral fields were normal but there was a large central scotoma in each eye. A diagnosis of bilateral retrolubular neuritis was made. Examination of his sinuses, teeth and tonsils revealed no abnormal clinical observations. Roentgenograms of his sinuses were normal and x-ray examination of the optic foramina showed that they were of normal size. General and neurologic examinations were entirely negative. Urine and blood examinations gave normal results. Blood and spinal fluid Wassermann reactions were negative, and the Ross-Jones and Noguchi tests were also negative. The patient was hospitalized and given foreign protein therapy from April 10 to June 25; this was given in the form of typhoid vaccine, intravenously, beginning with a small dose and gradually working up to a final dose of 500,000,000. The patient almost always had a good febrile reaction. After one of the early injections a small hemorrhage appeared in the right eye. The injections were stopped for a time and then cautiously begun again. The hemorrhage disappeared and there were no more. During this time the patient received also potassium iodide, in increasing dosage, and vitamin B therapy. He had previously used tobacco moderately and occasional small amounts of alcoholic liquor. However, during his stay at the hospital he had none of either. There was steady improvement of vision for several weeks, so that vision in the right eye, which had decreased from 0.2—1 to 10/200, gradually improved to 0.1. Vision in the left eye improved to 7/200. However, in the first part of June vision again began to decline and definite atrophy of both disks began to be manifest. In July the patient was referred to the Wisconsin General Hospital, at which the diagnosis was also chronic bilateral retrolubular neuritis. A chemical examination of the patient's blood and urine was made at the department of pharmacology and toxicology, which revealed that 19.79 Gm. of blood contained 0.024 mg. of lead, 100 Gm. of blood contained 0.121 mg. of lead, 910 cc. of urine contained 0.073 mg. of arsenic trioxide and 910 cc. of urine contained 0.027 mg. of lead. Examination of a sample of the fluid in which the patient had constantly dipped his hands while in the employ of the shoe factory revealed that it was a water emulsion of some fatty substance and contained 0.2 mg. of arsenic (expressed as As₂O₃) and 0.48 mg. of lead per hundred cubic centimeters of solution. Is it possible that the patient's retrolubular neuritis could be due to lead and arsenic? Is it possible that such minute amounts in the solution he used could produce such a marked effect on his optic nerves? Should this be considered a medicolegal case and the shoe factory be made responsible for the patient's loss of vision? There were at no time any other evidences of lead poisoning.

M.D., Wisconsin.

ANSWER.—Absorption of lead and arsenic through the skin does not occur to an appreciable degree as the result of contact with aqueous solutions or suspensions of lead and arsenic compounds in the concentrations reported, and it is improbable that significant quantities would be ingested because of contaminated hands. The analytic data, obtained some months after the cessation of the occupational exposure, are unconvincing. The urinary lead concentration of 0.03 mg. per liter is well within normal limits. The urinary arsenic concentration, while somewhat higher than that of lead, is also within the upper range of normal values. The one result that suggests abnormal lead absorption was that obtained on the blood. This result is quite inconsistent with the urinary lead concentration and cannot be accepted as valid without confirmatory analyses. Large amounts of potassium iodide may induce the removal of lead from the bones and thus provide increased lead content of the blood and an increased excretion of lead by way of the kidneys. In the absence of clinical evidences of lead absorption, the result on the blood is still more questionable. One must conclude that a diagnosis of neuritis due to lead or arsenic has not been established and that, as the case has been presented, there are no grounds for placing responsibility on the employer.

SILICOSIS AND PROPHYLACTIC ALUMINUM

To the Editor:—I have been told by patients of a new silicosis "cure" presented in an exhibit at the world's fair in San Francisco last summer. I have no definite information regarding this new treatment, but it has been described as the inhalation of some aluminum compound. I would appreciate having any information concerning this treatment that you may have available.

Robert S. Smith, M.D., Boise, Idaho.

ANSWER.—At the University of Toronto, experiments dealing with silicosis have been under way for some time. The most recent experiments have dealt with the effect of aluminum dust. Experimentally it has been shown that aluminum dust in concentrations of less than 1 per cent in mixtures of silica dust will prevent the development of silicosis in experimental animals. The effects of other mineral dusts on the development of silicosis in animals has also been studied there and at other laboratories. Sufficient time has not yet elapsed for full evaluation of the merit of this mode of prevention. Certainly it cannot replace adequate medical and engineering control. There is no knowledge of its adequate trial in man; such an experiment would, of course, require many years and would be most costly.

If this procedure is of value, it is useful only in prevention; it is of no therapeutic value once the disease (silicosis) is established.

A full report of the basic work in this problem has been presented by J. J. Denny, W. D. Robson and D. A. Irwin (The Prevention of Silicosis by Metallic Aluminum: A Preliminary Report, *Canad. M. A. J.* 37:1 [July] 1937; The Prevention of Silicosis by Metallic Aluminum: II, *ibid.* 40:213 [March] 1939; The Prevention of Silicosis by Metallic Aluminum: A Study of the Effect of Metallic Aluminum—Its Mode and Permanence of Action, Effective Dosage and Methods of Administration, *Industrial Med.* 8:133 [April] 1939).

SPRUE

To the Editor:—In Queries and Minor Notes in The Journal Dec. 30, 1933, page 2445, there is an answer to a question entitled "Probable Sprue." It seems to me that the individual who answered this question has put The Journal on record as being out of date in the diagnosis of sprue. Taking up the specific questions seriatim: 1. The data given certainly do not substantiate a diagnosis of sprue. 2. The finding of Monilia in anything whatever to do with the diagnosis. 3. Further investigation certainly should include adequate stool examination both for bacteria and protozoa, sigmoidoscopic examination and gastric analysis. 4. The assumption made is not borne out by the letter of inquiry, and the advice to give potassium iodide is simply nonsense. Incidentally, what is meant by the "alterative action" of potassium iodide? 5. The dextrose tolerance test is of decided importance in a case such as this and might even lead the way to diagnosis with reference to sprue. All in all, I consider the answer to the question unsatisfactory and inadequate.

Alfred C. Reed, M.D., San Francisco.

To the Editor:—In the Dec. 30, 1933, issue of The Journal, the reply to a query concerning a probable case of sprue seemed inadequate and also somewhat inaccurate. In the opinion of most of the recent writers in this field, the finding of Monilia in the stool of the patient is of no definite diagnostic value. The suggested use of potassium iodide therapy has no rational basis. As aids in diagnosing the patient's condition, the following procedures would be helpful: 1. Stool fat analysis, the dietary intake of fat being known. On the usual diet the patient with sprue will have steatorrhea with a marked increase in the stool fatty acids. If the diet is low in fat, however, steatorrhea may not be found, for it is largely dependent on the dietary intake of fat (Bassett, *ibid.* 18:121 [Jan.] 1939). 2. X-ray examination of the small intestine. In sprue this will reveal variations in caliber, pocketing, stercoriation, mucosal changes and disturbances of motility (Mackie, T. T., Miller, D. K., and Rhoads, C. P.: *Am. J. Trop. Med.* 15:571 [Sept.] 1935). 3. Oral dextrose tolerance test. Contrary to the published report, the oral dextrose tolerance test is of importance in sprue. The dextrose tolerance curve in sprue is usually low or "flat" (Thaysen, T. E. H.: *Nontropical Sprue*, London, Oxford University Press, 1932. Hanes, F. P., and McBryde, Angus: Identity of Sprue and Celiac Disease, *Arch. Int. Med.* 58:1 [July] 1936). The probable causes for the "flat" curve will be discussed in a formal report at a later date, but for the present it may be stated that the following factors seem involved: (a) Slow absorption of dextrose from the small intestine (Green, Judah: *New England J. Med.* 218:247 [Feb. 10] 1938). (b) "Increased tolerance" for carbohydrate produced by (1) the high carbohydrate diet which is usually ingested by patients with sprue and (2) the high carbohydrate content of the stool actually absorbed by these patients. The passage of blood in the stool is unusual in sprue and warrants complete study of the lower gastrointestinal tract for other possibilities. It must be remembered that so-called symptomatic sprue as opposed to idiopathic sprue is a syndrome that may be produced by a variety of disorders of the intestinal tract. The diagnosis of the latter is made largely by exclusion. As for treatment, the best results have been obtained with large parenteral doses of relatively crude liver extracts and special diets which have been described by Miller, D. K., and Barker, W. Halsey: *Clinical Course and Treatment of Sprue*, *Arch. Int. Med.* 60:385 [Sept.] 1937). Here again it should be stressed that in cases of some years' standing, response to treatment may be variable, slow and at times unsatisfactory.

Michael J. Lepore, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examination of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, February 10, page 515.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.
ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Box 561, Juneau.
ARIZONA: Basic Science. Tucson, March 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson.
ARKANSAS: Basic Science. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. Medical (Regular). Little Rock, June 6-7. Sec., Dr. L. Owens, Harrison. Medical (Eclectic). Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.
CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco, April 17. Written examination. Los Angeles, Feb. 26-29. Sec., Dr. Charles S. Pinkham, 1020 N St., Sacramento.
CONNECTICUT: Medical. Hartford, March 12-13. Sec., Dr. T. P. Murdoch, 147 W. Main St., Meriden. Homeopathic. Derby, March 12-13. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.
DELAWARE: Examination. Dover, July 9-11. Reciprocity. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.
DISTRICT OF COLUMBIA: Basic Science. Washington, April 22-23. Medical. Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.
FLORIDA: Basic Science. De Land, May 25. Sec., John F. Conn, De Land. Medical. Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.
GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.
IDaho: Boise, April 2. Dir., Bureau of Occupational Licenses, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.
ILLINOIS: Chicago, April 2-4. Acting Superintendent of Registration, Mr. Lucien A. Fife, Springfield.
INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. I. W. Bowers, 301 State House, Indianapolis.
IOWA: Medical. Des Moines, March 4-6. Basic Science. Des Moines, April 9. Dir., Division of Licensure and Registration, Mr. H. W. Greife, Capitol Building, Des Moines.
KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.
KENTUCKY: Louisville, June 5-7. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.
MAINE: Portland, March 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.
MARYLAND: Medical. Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homeopathic. Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.
MASSACHUSETTS: Boston, March 12-14. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.
MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.
MINNESOTA: Basic Science. Minneapolis, April 2-3. Sec., Dr. J. Charney McKinley, University of Minnesota, 126 Millard Hall, Minneapolis. Medical. Minneapolis, April 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.
MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson.
MONTANA: Reciprocity. Helena, April 1. Examination. Helena, April 2-3. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.
NEBRASKA: Basic Science. Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.
NEW HAMPSHIRE: Concord, March 14-15. Sec., Dr. T. P. Burroughs, State House, Concord.
NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.
NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.
NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 412 S. Third St., Grand Forks.
OHIO: Reciprocity. Columbus, April 2. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.
OKLAHOMA: Basic Science. Oklahoma City, May 9. Medical. Oklahoma City, June 5-6. Sec., Dr. James D. Osborn Jr., Frederick.
OREGON: Basic Science. Corvallis, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.
PUEERTO RICO: Santurce, March 5. Sec., Dr. O. Costa Mandry, Box 3854, Santurce.
TEXAS: San Antonio, June 20-22. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.
VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.
WEST VIRGINIA: Charleston, March 4-6. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.
WISCONSIN: Basic Science. Madison, April 6. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. Medical. Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

District of Columbia Reciprocity Report

Dr. George C. Ruhland, secretary, District of Columbia Commission on Licensure, reports seven physicians licensed by reciprocity and one physician licensed by endorsement, December 22. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University School of Medicine.....	(1934)		Maryland
Howard University College of Medicine.....	(1935)		Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1932)		Maryland

University of Michigan Medical School.....	(1936)		Penna.
Washington University School of Medicine.....	(1937)		Missouri
Albany Medical College.....	(1901)		New York
Temple University School of Medicine.....	(1932)		Penna.
School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Vanderbilt University School of Medicine.....	(1931)		N. B. M. Ex.

Florida November Examination

Dr. William M. Rowlett, secretary, Florida State Board of Medical Examiners, reports the written and practical examination held at Jacksonville, Nov. 13-14, 1939. Thirty-two physicians were examined, twenty-nine of whom passed and three failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Emory University School of Medicine.....	(1937),	(1939)	2
University of Georgia School of Medicine.....	(1933)		1
Rush Medical College.....	(1932),	(1937)	2
The School of Medicine of the Division of Biological Sciences.....	(1933)		1
Indiana University School of Medicine.....	(1930)		1
University of Louisville School of Medicine.....	(1938)		1
Louisiana State University Medical Center.....	(1935)		1
Tulane University of Louisiana School of Medicine....	(1935),	(1939) 2	
Johns Hopkins University School of Medicine.....	(1935)		1
.....	(1936)		1
.....	(1938)		1
.....	(1936)		1
.....	(1935)		1
.....	(1931),	(1936)	2
..... college.....	(1917),		
(1928) 2			
University of Rochester School of Medicine.....	(1938)		1
Temple University School of Medicine.....	(1939, 3)		3
Medical College of the State of South Carolina.....	(1926)		1
Vanderbilt University School of Medicine.....	(1932)		1
Marquette University School of Medicine.....	(1935, 2)		2
Universität Bern Medizinische Fakultät.....	(1917)		1
School	FAILED	Year Grad.	Number Failed
University of Kansas School of Medicine.....	(1930)		1
Long Island College Hospital.....	(1921)		1
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen.....	(1922)		1

Mississippi December Reciprocity Report

Dr. R. N. Whitfield, assistant secretary, Mississippi State Board of Health, reports seventeen physicians licensed by reciprocity and one physician licensed by endorsement, December 5. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois College of Medicine.....	(1914)		New York
University of Louisville School of Medicine.....	(1934)		Kentucky
Louisiana State University Medical Center.....	(1937)		Louisiana
Tulane University of Louisiana School of Medicine.....	(1933),		
(1934) Louisiana			
Harvard Medical School.....	(1932)		California
University of Minnesota Medical School.....	(1938)		Louisiana
Miami Medical College.....	(1901)		Illinois
Meharry Medical College.....	(1936)		Tennessee
University of Tennessee College of Medicine.....	(1936, 2),		
(1937, 2) Tennessee			
Vanderbilt University School of Medicine.....	(1935)		Tennessee
Medical	(1932)		Minnesota
Universit	(1936)		Virginia
School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Georgetown University School of Medicine.....	(1909)		N. B. M. Ex.

South Carolina November Examination

Dr. A. Earle Boozer, secretary, State Board of Medical Examiners of South Carolina, reports the written examination held at Columbia, Nov. 14, 1939. The examination covered seventeen subjects. Three candidates were examined, all of whom passed. Five physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine.....	(1939)		80.6
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1934)		75
Harvard Medical School.....	(1936)		80
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Emory University School of Medicine.....	(1935)		Georgia
Meharry Medical College.....	(1938)		Tennessee
Vanderbilt University School of Medicine.....	(1938)		Tennessee
Medical College of Virginia.....	(1929)		N. Carolina
University of Virginia Department of Medicine.....	(1937)		Virginia

Book Notices

BOOK NOTICES

Jour. A. M.
Feb. 17, 1

Industrial Dermatoses. Symposiums Presented at Meetings of American Medical Association and American Dermatological Association. Paper. Price, \$1 each; \$9 per 10 copies; \$20 per 25 copies. Pp. 174, with 5 illustrations. Chicago: American Medical Association, 1939.

The Sections on Dermatology and Syphilology both of the American Medical Association and of the American Dermatological Association have recently conducted symposiums on industrial dermatoses. This pamphlet is a convenient and valuable collection under one cover of all the papers presented, together with discussions. The symposiums were organized in such fashion as to permit orderly and logical presentation of most of the important aspects of this troublesome subject. There is remarkably little duplication of material as between the presentations in these two meetings. Under this arrangement attention is successively directed to the need for professional education in occupational diseases and to their incidence both in comparison to all cutaneous diseases and to compensable occupational diseases, to criteria for diagnosis which ought to be particularly helpful to specialists and general practitioners alike, and to practical prevention. Several papers are devoted to the relation of occupational dermatoses to workmen's compensation principles and procedure, both as general discussions and as specific problems in certain of the individual states. Separate studies concern erysipeloid, chronic granuloma and melanosis due to photosensitization as industrial problems, and there is also a timely discussion of the hazards associated with the manufacture of war gas. This collection succeeds in establishing the fundamental methods of attacking a rapidly growing and exceedingly complex medical problem. The professional status of the participants in the symposiums leaves no doubt as to the authenticity and value of their contributions.

Semeiologia del midollo osseo: Studio di morfologia clinica. Di Aminta Fieschi. Prefazione di Adolfo Ferrata. VI. Biblioteca "Haematologica." Diretta da Adolfo Ferrata. Paper. Price, 70 lire. Pp. 354, with 121 illustrations. Pavia: Tipografia già Cooperativa, 1938.

In the past six years many monographs dealing with sternal puncture have been published, but in no case has the reproduction of marrow cells equaled the excellent illustrations of Fieschi's book. This point is justly emphasized in the preface by Adolfo Ferrata, the maestro of Italian hematology. The sixteen chapters cover a study of bone marrows from every type of blood dyscrasia and even include a discussion of the morphology of metastatic tumor cells. The author has attempted to carry the study of myelograms beyond the realm of percentages obtained by making differential counts and has emphasized the functional state of the marrow: there are three forces which regulate the composition of the marrow: a proliferative force, an evolutive or maturative force, and a migratory force which regulates the passage of cells into the blood stream. In order to study the proliferative force the author has made an extensive study of the frequency with which mitotic figures, aberrations and degenerations during the karyokinetic process appear. It is interesting to note that in pernicious anemia megaloblasts show a tendency toward multiple mitoses. In hemoglobin-bearing megaloblasts, mitotic figures are not so numerous and they tend to be of a degenerative type. To study the evolutive force, Fieschi has devised a curve of maturation for the nucleated red cells and neutrophilic myelocytes which considers the numerical relations existing between the elements of the same category. The author has little faith in the leuko-erythroblastic ratio and believes that it is much more important to observe abnormal cells and those elements which are normally present in small numbers. Like most European hematologists, Fieschi has not been influenced by Doan, Cunningham and Sabin's theory of erythropoiesis and consequently describes megaloblasts in all phases of maturation as being the dominant characteristic in pernicious anemia (contrary to an abnormal maturation in this disease. The difficulties encountered when one tries to distinguish between marrows from cases of chronic infection and toxic conditions and those of leukemia are discussed. The former can generally be identified by the presence of toxic granulation and increase in plasma cells,

endothelial macrophages and histiocytes of various types. Sternal puncture in lymphatic leukemia has a greater diagnostic importance than in myelogenous leukemia. Typical cases will show 50 per cent or more lymphocytes in the marrow. But there are some cases in which the marrow does not show any leukemic change at all. This monograph contains many new ideas concerning the interpretation of bone marrow pictures. Some of the methods of study, especially those of mitotic figures, are too time consuming and detailed to be of practical value. But they, as well as the entire book, are recommended to hematologists interested in the fundamentals of marrow morphology and function.

Experimental Pharmacology and Materia Medica. By Dennis E. Jackson, Ph.D., M.D., F.I.C.A., Professor of Pharmacology, Materia Medica and Therapeutics in the University of Cincinnati College of Medicine. Cincinnati. Second edition. Cloth. Price, \$10. Pp. 906, with 81 illustrations. St. Louis: C. V. Mosby Company, 1939.

This well known and much quoted work is a source book for experimentalists. The present edition, twice as voluminous as the first, is comprehensive in experimental methods, technique and subject matter. Directions are given in detail but they are not prolix. Detail makes the difference between success and failure in an experiment. Michelangelo said "Trifles make perfection, but perfection is no trifle." Jackson has followed the gleam of Michelangelo and has shown an enormous capacity for taking pains.

The unit of procedure is the experiment. The aim is to develop a knowledge and appreciation of general pharmacologic reactions. Since there are about 400,000 known organic preparations and about as many inorganic preparations, he has used the economic principle of grouping drugs according to systemic effects. The groupings include drugs acting on the (1) central nervous system, (2) heart and circulation, (3) respiration, (4) alimentary tract, (5) kidneys and (6) involuntary nervous system. The author well recognizes that no strictly scientific or logical presentation or arrangement of such a vast number of heterogeneous substances is yet possible. He has, however, made progress in this direction.

Pharmacology is the most prominent liaison subject in medicine. Anatomists, biochemists, surgeons, internists, obstetricians, students of nutrition and practitioners of the other specialties are interested intensely in problems that involve pharmacology. The book should be of interest to each of them. It furnishes a method of procedure for almost all branches. It is impossible to summarize or evaluate the 217 animal experiments, to which the author has devoted 700 pages. Suffice it to say that if one desires to learn how to proceed in almost any field of experimental pharmacology one is likely to find it described. To guide in the work there are twenty-nine color plates on dissection and technique, and twenty-six color plates of drugs. In addition there are numerous illustrations and records to show and explain results. New drugs such as sulfanilamide, sulfapyridine, prostigmine and metrazol are included.

The experiments are arranged for economy both of animals and of time, and for comparing and showing differences in action of drugs; for example, experiment v is devised to show the action of ether, chloroform, epinephrine, acetylcholine, bromide and barium chloride on blood pressure, on respiration, on stomach contractions and on the pupil; experiment CLXXII to show the action of digoxin, digitoxin, thevatin and strophanthin on blood pressure, respiration, diuresis, spleen volume and leg volume; experiment CXV to show the action of lobeline, cyanide, sodium sulfide and carbon dioxide on the carotid sinus, carotid body, aortic nerve, aortic body, blood pressure and respiration. These and many similarly arranged experiments emphasize both the pharmacology and the physiology involved in the actions.

Included in this edition is a new section on materia medica and prescription writing. A feature is the color plates of many plants, such as pilocarpus, digitalis and ergot, which yield important and useful drugs. Solubility tables, a list of words and abbreviations, a Latin-English vocabulary and an adequate index complete the volume, a work that demanded an enormous amount of laboratory work, supreme patience and perseverance. The workmanship of the book is excellent. The illustrations, descriptions and directions are definite and clear. This book will retain its place as a classic in experimental pharmacology.

The Surgery of Injury and Plastic Repair. By Samuel Fomon, Ph.D., M.D. Cloth. Price, \$15. Pp. 1409, with 925 illustrations. Baltimore: William Wood & Company, 1939.

This large book, which represents an immense amount of research, is an ambitious attempt to encompass within one volume the entire literature of traumatic surgery. The author admits falling short of the mark, as the special surgery of the neck, trunk and extremities was withheld for a future volume to supplement the present one, which deals with the structures of the exterior head. However, since almost half of the book is taken up with fundamental principles of surgical repair, it is quite evident that the most important part of the work is herein offered in complete form. The author has thoroughly analyzed the literature and presented every recognized point of view with regard to manifold aspects of traumatic surgery in general and presents them without bias so that the reader can judge for himself. The general preoperative and postoperative care of the patient, choice of anesthetics, methods of administering them, details of operating room procedure, care of shock, acid base balance and many other factors are presented thoroughly and to the last detail. Much space is devoted to the most elementary details, such as the incision, proper excision of tissue, rearrangement for suturing, types of sutures and suture material, wound dressings, tissue transplants and grafts, so that one need hardly look further for information to cover any imaginable situation. Certainly the profusion of illustrations, line and wash drawings, some with color, are in themselves a liberal education. The author evidently had in mind the average general practitioner, who usually sees the injured person first and whose initial treatment may have a great bearing on the ultimate result obtained. Yet even the experienced surgeon or the specialist in regional plastic surgery into whose hands these cases come later for the correction of traumatic defects will find much that is useful and clarifying in the abundant text. The special chapters on plastic surgery of the nose, eyelids, jaws and face, which include a considerable number of cosmetic procedures, follow the customary practice of the day and are presented simply, so that even the novice may grasp their frequently complex details. A voluminous bibliography follows each important chapter and should prove of utmost value to the student and research worker. This work of Dr. Fomon's must be seen to be appreciated, since it holds the answer to a vast number of questions that are frequently unanswered in books on general surgery. In this day and age of high speed, increasing trauma and a public that is plastic conscious, it behooves every surgeon and general practitioner to familiarize himself with the latest developments in these fields. Fomon's book should fill that need.

Epidemischer und sporadischer Ikterus: Eine statistisch-epidemiologische und klinische Untersuchung. Von Per Selander. Acta paediatrica. Vol. XXIII. Supplementum IV. Paper. Pp. 251, with 16 illustrations. Uppsala: Appelbergs Boktryckeriaktiebolag, 1939.

This monograph by Selander concerns the clinical and statistical study of epidemic and sporadic icterus. In reviewing the literature the author notes that the infective agent of icterus is unknown and that there are differences of opinion as to whether there are two distinct types of the disease or whether there is only one manifesting itself sporadically or in epidemics. In an attempt to clarify the issue the author studied 1,200 cases and reports as follows:

1. As far as onset is concerned, no difference between the two forms could be determined, although sporadic icterus occurred often in the age bracket between 2 and 7 years, while the epidemic form was more frequently seen in the 7 to 15 year group. Sex seems to have no influence on the incidence of either type of icterus.

2. In an epidemic in Gotland the reported incidence among younger patients was greater in the cities than in the country, while in the older group of children the opposite was the case. The author is unable to explain this phenomenon.

3. In both forms of the disease a time factor was evident. June and July saw a minimum and October and November a maximum of cases. This parallels the general incidence trend of contact infections as opposed to diseases, such as typhus and dysentery, which manifest themselves in alimentary disturbances.

4. The incubation time has been generally believed to average from two to four weeks in epidemic icterus. However, in examining patients convalescing from various ailments read-

mitted to the hospital because of icterus, the author found an average period of from two to three months between the initial discharge and the readmission. Most of the icterus patients had been in the hospital previously. These observations indicate a longer incubation period than is known to exist for any other acute disease, and because an epidemic could hardly flare up when the incubation period is so long there must be a form of the disease which does develop rapidly; therefore the author concludes that epidemic and sporadic icterus are separate entities, although he recommends further investigation to verify this opinion.

5. As far as symptoms are concerned, sporadic and epidemic icterus appear alike. A difference in symptoms was noted, however, between age groups. In adults the onset is more gradual and the hyperbilirubinemia reaches a maximum more slowly than in children: at the same time the icterus becomes increasingly severe according to the increasing age of the patient, it lasts longer in older persons and convalescence is slower. The sedimentation rate in children increases from the first to the second week and falls somewhat in the third. In adults the rate is higher in the second week than in the first and is still higher in the third.

6. A high icterus frequency was noted in persons with diabetes.

7. Cases of syphilis and acute yellow atrophy of the liver were also observed in the series, but the connection if any between these conditions remains unexplained.

Der Rheumatismus: Sammlung von Einzeldarstellungen aus dem Gesamtgebiet der Rheumaerkrankungen. Herausgegeben von Professor Dr. Rudolf Jürgens, Stellv. Direktor der Universitätsklinik für natürliche Heil- und Lebensweisen und Chefarzt des Augusta-Hospitals Berlin. Band XVI: Die Ischias. Von Dr. med. Hans-Georg Scholtz, dirigierender Arzt der Abteilung für Physikalische Therapie am Städt. Rudolf-Virchow-Krankenhaus Berlin. Paper. Price, 4.87 marks. Pp. 111, with 24 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1939.

This monograph deals with pathology, anatomy, symptoms and therapy of "sciatica." The methods of treatment discussed include diet, antineuralgic medicines, homeopathic medicines, injections, baths, heat, contrast applications, hydrotherapy, galvanic and faradic stimulation, diathermy, roentgen therapy, radium therapy, massage, gymnastics, perineural injections, mud baths, sand baths, hyperthermia and manipulation.

A Guide to Workmen's Compensation: The Law and Its Practice in New York State. By H. D. Margulies and Max Bloom. Paper. Price, 50 cents. Pp. 96. New York: Progress Books, 1939.

On the basis of court decisions and the publications of the Labor Department of New York, the authors, both of whom are members of the New York bar, have attempted in this small paper-back booklet a comprehensive statement of the New York workmen's compensation act in popular, simple terms for the guidance of the worker, his trade union, his representative or attorney and his physician. Appended are sixteen selected rules for physicians promulgated by the state industrial commission.

Die Funktion der Nebennierenrinde. Von F. Verzar, Professor der Physiologie an der Universität Basel. Cloth. Price, 25 Swiss francs. Pp. 266, with 16 illustrations. Basel: Benno Schwabe & Co. Verlag, 1939.

This monograph contains thirty-one pages of references, which number well over a thousand. As might be expected from such a bibliography, the literature has been well reviewed. The author is to be commended for his division and organization of the material, which can best be illustrated by mentioning the chapter headings. The first forty-eight pages is devoted to the physiologic anatomy, the physiology, the preparation and the standardization of the adrenal extracts. Those compounds from the adrenal cortex isolated in crystalline form at the time of writing are discussed. The effects of the adrenal on the organism as a whole are then taken up in chapters on asthenia, carbohydrate metabolism, fat metabolism, protein metabolism, vitamins B and C, sodium metabolism, potassium metabolism, theory of cortical action, circulation after adrenalectomy, respiration after adrenalectomy, heat regulation, hypertrophy and atrophy of the adrenals, the relation between the adrenals and the other glands of internal secretion, and the relation between the adrenals and the sex glands. The final twenty pages is devoted to clinical considerations. It is obvious that the book is more valuable to the physiologist than to the physician. The author's contribu-

tion to the field has been largely in the field of absorption after adrenalectomy. He believes that cortical hormone is necessary for the absorption of fat and has published several papers in support of his views. Other investigators have been unable to repeat his experiments when the animals are kept in better condition by sodium chloride administration and have used fats less irritating to the gastrointestinal tract. It seems that more work is necessary to establish the role of the adrenals in absorption.

La fragilité osseuse congénitale (maladie de Durante). Par H. Fulconis. Préface du Professeur Laffont. Paper. Price, 28 francs. Pp. 134, with 14 illustrations. Paris: Masson & Cie, 1939.

This book on congenital fragility of bones, or osteogenesis imperfecta, is an instructive monograph on what the author calls Durante's disease. The subject is covered from various angles including the clinical and biologic. The author discusses the skeleton of the newborn, various clinical forms and the relationship of the glands of internal secretion. Evolution of the lesion is described and therapeutic deductions are given. There is a large bibliography. The monograph will interest special workers in this field.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Liens: Lien Effective Despite Compromise of Accident Case.—One of the plaintiffs was a physician who owned a hospital in Prescott, Ark. The other plaintiff was a registered nurse in the hospital. In November 1935 an employee of the defendant lumber company was severely injured in an automobile accident and was brought to the physician's hospital for treatment. The lumber company from time to time paid the medical, hospital and nursing bills until in December, when the employee filed suit against the company for damages, claiming that it had furnished him a car with defective brakes. The company then notified the physician that it would not assume financial responsibility for further services rendered the employee. Thereafter the physician and the nurse filed claims of lien under an Arkansas law which provides that a practitioner, hospital or nurse shall, on compliance with the provisions of the act, have a lien for the value of service rendered a patient for the relief or cure of an injury suffered through the fault or neglect of another, on any claim, right of action, and money to which the patient is entitled because of that injury. The law further provides that a tortfeasor who after being notified of a claim of lien pays to the injured patient anything of value as a settlement or compromise shall be liable to the lienors in an amount not in excess of the amount to which the patient was entitled from the tortfeasor.

After the claims for liens were filed, and while the suit by the employee against the lumber company was still pending, the company settled with the employee for \$4,000 without paying the claims of the physician and the nurse. Immediately on learning of the settlement and of the dismissal of the damage suit, the lienors applied to the court for an order to set aside the dismissal of the damage suit and for judgments against the company for the amounts of their claims. The trial court set aside its order of dismissal and set the case for trial. The burden of proving that the company was liable to the employee for the injuries he received was imposed on the physician and nurse, and the trial resulted in a directed verdict for the company, the court holding that the employee assumed the risk of driving the truck with defective brakes and that, since he could not have recovered from the lumber company because of that fact, the physician and nurse were without recourse against the company. The physician and nurse then appealed to the Supreme Court of Arkansas.

The company defended on the ground that it was not a tortfeasor within the meaning of the lien act, since the trial court had held that it was not liable to the employee. If the lumber company was a tortfeasor, said the Supreme Court, then the company clearly violated the provisions of the lien act because it was undisputed that it paid the employee \$4,000 in settlement

of his claim against it without having previously paid to the plaintiffs the amounts of their claims. In the opinion of the Supreme Court, the trial court misconstrued the lien act when it required the plaintiffs to assume the burden of proving a case of liability on the part of the company to the employee after a settlement had been made. If no settlement had been made and if the case had been brought to trial, then the burden of making a case would have been on the employee and if he had failed the liens of the plaintiffs would have failed also. But by compromising and paying \$4,000 to the employee, the company admitted in effect that it was in the wrong, was a tortfeasor, even though it took a release from the employee absolving it from blame.

It may be, the court said, that the employee was not legally entitled to the \$4,000 paid him, but the lumber company cannot be heard to say that he was not, because it voluntarily paid it to him in compromise of a claim of \$85,000. The lien act was enacted for the very humane purpose of encouraging physicians, hospitals and nurses to extend their services and facilities to indigent persons who suffer personal injuries through the negligence of another by providing the best security available to assure compensation for services and facilities. As the court viewed the act, it places no burden on industry nor does it tend to discourage settlements. The alleged tortfeasor may defend the action in the courts. If there is no liability on the part of the alleged tortfeasor, the lien claimant loses his claim for services. If the case is compromised, all the tortfeasor has to do is either to pay the lien claimant or get a written release of the lien claim from him.

The Supreme Court, therefore, reversed the judgment of the trial court and remanded the cause with direction to establish and enforce the lien of the plaintiffs for the amounts of their respective claims.—*Buchanan et al. v. Beirne Lumber Co. (Ark.)*, 124 S. W. (2d) 813.

Undertakers: Solicitation of Dead Bodies as Cause for Suspension of License.—The California funeral directors' and embalmers' law authorizes the board of examiners to revoke or suspend the license of a licensee who engages in the solicitation of dead human bodies, whether such solicitation occurs after death or while death is impending. Under a complaint charging a violation of this provision, the board suspended the embalmer's licenses of Drummey and Wilson and the funeral director's license of the latter. The superior court, city and county of San Francisco, issued a writ of mandate commanding the board to restore the licenses so suspended, and the case came before the Supreme Court of California for review.

The court could find nothing arbitrary or discriminatory in the provisions of the law prohibiting the direct solicitation of dead human bodies after death or while death is impending. The provision appeared to the court to be a reasonable regulation bearing a definite relation to the public health. It obviously was aimed at preventing the commercialization of death at a time when those concerned are emotionally upset and easily imposed on. The licensees further contended that the act was unconstitutional because it failed to provide for a proper notice of hearing. The act, observed the court, provides that the power to revoke or suspend a license shall be exercised "after proper hearing and notice to the licensee." It was urged, however, that the act was unconstitutional because it did not specify the form, manner, extent or duration of notice. Due process does not require, the court pointed out, any particular form of notice or method of procedure. If an act provides for reasonable notice and a reasonable opportunity to be heard, that is all that is required.

The board, in attacking the judgment of the trial court, contended that the writ of mandate is not available to a person who has been improperly deprived of a license by an administrative board to secure the restoration of that license. With this contention the Supreme Court could not agree. It has been held, the court said, that certiorari is not the proper remedy, since such boards do not and cannot exercise judicial powers, the theory being that, if the legislature attempted to confer judicial or quasi-judicial powers on statewide administrative boards, the statute would violate the California constitution, which vests the entire judicial power of the state in the courts, with certain

enumerated exceptions. The writ of prohibition likewise cannot be used to restrain administrative boards from taking action, for the reason that the office of the writ of prohibition is limited by the California constitution to the restraint of a threatened exercise of judicial power in excess of jurisdiction. In the absence of a proper statutory method of review, mandate is the only possible remedy available to those aggrieved by administrative rulings of the nature here involved. Furthermore, the court continued, since the administrative board did not exercise judicial or quasi-judicial functions, its findings based on conflicting testimony are not binding on the courts. If in the present case it should be held that the board's action in cancelling or suspending an existing license is binding on the courts, if such action is predicated on conflicting evidence, it would necessarily follow that the board exercised at least quasi-judicial powers, it being the essence of judicial action that finality is given to findings based on conflicting evidence. In addition, if an administrative board deprives a person of an existing valuable privilege without the opportunity of having the finality of such action passed on by a court of law, the due process clause of the federal constitution would probably be violated. The trial court, having power to weigh the evidence, must be conclusively presumed to have performed its duty, and its determination of the facts, based on conflicting evidence, is binding on appeal. The judgment directing the issue of the writ of mandate was therefore affirmed.—*Drumney v. State Board of Funeral Directors and Embalmers (Calif.)*, 87 P. (2d) 848.

Workmen's Compensation Acts: Silicosis an Accidental Injury, Not an Occupational Disease.—The claimant worked for the defendant lead company in its lode mine from August 1931 to April 1936, during which period he contracted silicosis for which the industrial accident board denied him compensation. He then appealed to the Supreme Court of Idaho.

One of the several issues before the court was whether or not the claimant's disability was due to an occupational disease for which no compensation was payable under the workmen's compensation act of Idaho. The evidence showed without material dispute that the rock in the mine in which the employee worked had a high silica content, that it was hard and that of the twenty-nine drills used only nine were wet drills. The wet drills were used only intermittently when the state mine inspector made his visits; when properly used the wet drills did away with the extremely dusty condition which otherwise prevailed. The result of the use of dry drills instead of the wet drills, the inadequacy of the ventilation system, the resultant exposure of the miners to silicosis and the forced condition of employment (the testimony being that when the miners complained of these conditions they were told that if they didn't like it they could quit) were all known to the lead company, the court pointed out. In addition, the company knew through its managing employees that the claimant, during his period of employment, lost weight and appetite and became short of breath and afflicted with a cough, all well known symptoms of silicosis. The authorities, the court pointed out, all agree that silicosis is in large part preventable by one device or another. The evidence in this case conclusively showed that the company, by its own experience, in its own mine, knew that by the use of wet drills the hazard could have been done away with, or at least greatly lessened. Under such circumstances the court did not believe that the claimant suffered an occupational disease within the meaning of the workmen's compensation act because an occupational disease, as viewed by the court, is one which inheres in the particular employment and cannot by reasonable means be prevented. Furthermore, the court said, the accident for which compensation is payable under the act need not occur at one instant, but there may be repetitious causes, all relatively slight, which culminate and result in as serious an injury and as frequently fatal as though the disabling or lethal blow or incident occurred at one time.

While compensation does not depend, the court pointed out, on the negligence of the employer, such negligence not only does not preclude compensation but compels it. The order of the board denying compensation to the claimant was therefore reversed and the cause remanded with instruction to award compensation.—*Brown v. St. Joseph Lead Co. (Idaho)*, 87 P. (2d) 1000.

Society Proceedings

COMING MEETINGS

- American Association of Anatomists, Louisville, Ky., Mar. 20-22. Dr. E. R. Clark, Dept. of Anatomy, Univ. of Pennsylvania School of Medicine, Philadelphia, Secretary.
- American Association of Pathologists and Bacteriologists, Pittsburgh, Mar. 21-22. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.
- American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.
- American Orthopsychiatric Association, Boston, Feb. 22-24. Dr. Norvelle C. La Mar, 149 East 73d St., New York, Secretary.
- American Physiological Society, New Orleans, March 13-16. Dr. Philip Bard, Johns Hopkins Medical School, Baltimore, Secretary.
- American Society for Experimental Pathology, New Orleans, March 13-16. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.
- American Society for Pharmacology and Experimental Therapeutics, New Orleans, March 13-16. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.
- Federation of American Societies for Experimental Biology, New Orleans, Mar. 13-16. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 9. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glen Bell, University of California Hospital, San Francisco, Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH

Twelfth Annual Meeting, Held in Chicago, Nov. 3 and 4, 1939

(Continued from page 522)

Heart Sounds Recorded Simultaneously with the Electrocardiogram

DRS. CLAYTON J. LUNDY and JOHN POST, Chicago: There is definite clinical value in obtaining tangible heart sound records. In 143 instances third heart sounds were recorded when they were not detected clinically. They were loudest in the presence of mitral stenosis and regurgitation with cardiac enlargement. No classification of recorded systolic murmurs was possible on the basis of the degree of heart involvement. No constant relationship was demonstrated between the type of recorded systolic murmur and severity or type of heart involvement.

A much needed dependable method of elucidation of diastolic murmurs is made available. In certain instances the loud diastolic murmur of aortic regurgitation masked the presystolic murmur of mitral stenosis on clinical examination, whereas the stethograph revealed the true facts in spite of marked tachycardia. The utility of this unprejudiced method is demonstrated further by the recording of a low pitched middiastolic murmur, which in this series of cases was not detected clinically in ten instances.

In fifty-three instances of stethographic mitral systolic murmurs, in nineteen with and in thirty-four without cardiac enlargement, there was no evidence of stenosis. In twenty-nine of these cases there were low amplitude, mixed diastolic sounds with and without clicks which could not be differentiated from breath sounds or room noise; in seven there were low amplitude and frequency sounds which diminished as middiastole was reached and increased as the succeeding first heart sound was reached; these were probably inaudible clinically and their significance remains to be explained. In twelve cases there was no reason; in five low frequency and low amplitude middiastolic murmurs occurred. Of seventy-three cases of clinical mitral stenosis and regurgitation, in forty the diagnosis was confirmed stethographically. In fourteen the condition was diagnosed on data other than a systolic murmur; in five there was a thrill without a presystolic murmur heard clinically and in nine there were short presystolic murmurs which were considered stethographically to be slapping first sounds and not true presystolic murmurs. In five cases diastolic murmurs were attributed to breath sounds and in four cases no reason could be ascribed.

A slapping first heart sound was recorded in nine instances in which the clinical diagnosis of presystolic murmur was unproved. A slapping second sound was recorded twenty-one times, in sixteen instances in the pulmonic area; this is the delayed snap (usually of the mitral valve) and was reported clinically only once.

DISCUSSION

DR. LOUIS KATZ, Chicago: The implication of the authors that an instrument for recording heart sounds is better than the clinician's ear in determining whether a murmur is present or absent is not a sound point of view. It must be determined that the heart sound recorder has the proper physical properties for adequately recording the vibrations in a manner similar to that which the average ear picks up. Most instruments exaggerate vibrations of low frequency with which they resonate, and they may not pick up the high vibration frequencies. Instrumental analysis should not replace clinical use of the special senses. These instruments perform a useful function in educating the ear but should not necessarily be used as the final court of authority. No instrument is as good as the ear of the properly trained clinician with good hearing. This is not to be interpreted as denying that clinicians vary in their experience and that some are actually tone deaf for certain sound ranges, nor does this statement deny that certain vibrations below the audible range can be recorded by such instruments in mitral stenosis. The aim in clinical practice should be to encourage and not to discourage the clinician to use his ears. This brings up the point that a sharp distinction should be made between those instruments which tend to record what the clinician can measure with his own senses and those instruments which give information not ostensibly obtainable by ordinary clinical means. The use of the latter should be encouraged; the former may not be needed for the ordinary clinical examination, however useful in research.

DR. EDWARD W. HOLLINGSWORTH, Hines, Ill.: I wonder what the authors mean by the term "unbiased." I do not believe they mean that the clinician is biased and it may refer to the fact that one obtains a mechanical graph of the sound. That depends on the accuracy of the instrument. I have used a home made instrument and am confused because the sounds are not duplicated. I think from a view of the authors' tracings that their machine acts similarly sometimes. The outstanding thing in such sound graphs is murmur and I am not sure but that a stethograph may be accurate; yet I think all such instruments are susceptible of further development and that the ear has to check the instrument and vice versa. The study of quality and timing of sounds may offer more information than the study of the murmur. This is a study which we should appreciate; it offers wide field for further work.

DR. M. J. SHAPIRO, Minneapolis: I should like to ask the authors what they mean by mitral regurgitation without cardiac enlargement. It was my impression that patients who had rheumatic fever but who did not show either cardiac enlargement or change in contour were recognized as having "potential heart disease" even though they had apical systolic murmurs. This may seem only of academic interest but for those who are carrying on a long time study in rheumatic heart disease it is necessary to be extremely careful in making the correct diagnosis in order to keep our records clear. I do not know how one makes a diagnosis of mitral regurgitation without evidence of cardiac enlargement or change in contour or both.

DR. FRANKLIN D. JOHNSTON, Ann Arbor, Mich.: This paper is timely and is indicative of the great interest relative to the graphic registration of heart sounds. Such records afford an objective check on impressions gained by auscultation, and evidence of this sort is rare in clinical medicine. I agree with Dr. Katz that care should be used in their interpretation, since the type of record that is obtained depends to a large extent on the nature of the recording system that is employed. I do not agree with Dr. Katz that the ear is always better than the graphic record. Low pitched sounds like auricular sounds or third heart sounds may be difficult for some individuals to hear and yet may be recorded without difficulty. I think that sound tracings are of great value for teaching purposes and that occasionally they are of some diagnostic worth. Concerning systolic murmurs, Dr. Bert Boone, of the United States Public Health Service, has taken sound tracings on a large group of normal children and in quite a few instances has found vibrations in systole while on careful examination no systolic murmur could be heard. I have had similar experiences occasionally, and I do not know exactly how to explain them. These vibrations are probably of no clinical significance.

DR. CLAYTON J. LUNDY, Chicago: Demonstration of murmurs in the past has been unsatisfactory, and I believe I am justified

in saying that the stethograph is here to stay. Criteria will be based on the records that are unbiased except in the technical sense indicated by Dr. Katz. Imperfections will be worked out. I believe this also answers Dr. Hollingsworth. Dr. Shapiro is undoubtedly correct about the heart association classification, but I must call attention to the insurance reports of a higher mortality rate among persons with a systolic murmur only. With that classification no consideration is given to the fact that it takes time for enlargement to take place and that the organic murmur must necessarily precede the accomplished fact of cardiac enlargement.

Effect of Distention of Abdominal Viscera on Blood Flow in Left Circumflex Coronary Artery

DRS. N. C. GILBERT, G. V. LE ROY and G. K. FENN, Chicago: The opinions of physiologists differ about the nature and significance of viscerocardiac reflexes. That modifications in cardiac rhythm occur after visceral irritation is accepted and it is generally believed that such variations are instigated by the vagus nerve. The presence of coronary artery vasoconstrictor fibers in the vagus is not generally accepted. However, we have seen many suggestive clinical instances in which relief or prevention of abdominal distention has mitigated cardiac pain and nocturnal dyspnea.

Acute experiments were performed on thirteen dogs on whose left circumflex coronary artery a thermistorium of the "direct current heater" type had been installed. Subsequently the chest was closed; observations of the blood flow in that artery and of the blood pressure and pulse in a femoral artery were made. The stomachs of these animals were distended, by means of moderate air pressure in a balloon introduced through the esophagus. Distention of the abdomen was obtained by inflating the peritoneal cavity through a trocar. Some of the dogs were later atropinized and vagotomized and the experiments were repeated. The results were as follows: Distention of the stomach caused significantly decreased blood flow in the left circumflex coronary artery eleven times and increases in blood flow two times. In these experiments the blood pressure increased more often than it fell, and pulse rate changes were variable; usually a slight decrease was noted. After atropinization and/or vagotomy, the blood flow in the coronary artery increased two times, was unchanged three times and decreased once when the stomach was distended. Distention of the peritoneal cavity resulted in increased blood flow two times and decreased blood flow four times. After atropine was given, the blood flow increased with each distention. We feel that these experiments demonstrate a reflex vasoconstriction of the coronary arteries resulting from stimulation by distention of the stomach or of the abdomen generally. Similar experiments in chronically affected animals, without anesthesia, are in progress.

DISCUSSION

DR. FRED SMITH, Iowa City: The experimental observations of Dr. Gilbert and his associates pertain to an important subject. The association of gastric symptoms with anginal pain is well known, but the explanation, while suspected, has not been heretofore conclusively demonstrated. Patients presenting this picture commonly state that they are able to obtain relief by eructation of gas. I have a patient who is able to walk a considerable distance without discomfort if she takes her time. However, the least bit of effort following a meal brings on anginal pain. Moreover, the pain may come on at this time while she is at rest, and the eructation of gas gives prompt relief. This would indicate that this patient has an increase in the gastric tension which is probably associated with pylorospasm. The following points in the study just reported appear to be significant: First, the conspicuous reduction in coronary circulation in the presence of elevation of the blood pressure is important because the level of the blood pressure is the most significant single factor in maintaining the rate of the coronary flow. Second, the reported influence on the coronary circulation may be reproduced repeatedly. Finally, the effects may be abolished by the administration of atropine. These facts in my opinion justify the conclusions of the authors.

DR. LOUIS KATZ, Chicago: The authors have demonstrated that distention of the stomach and duodenum can lead to a decrease in coronary flow in the dog. It is probable that this may also occur in man, although this is not necessarily the

case. For example, it is known that epinephrine increases the coronary flow and dilates the coronary vessels in animals, and yet in man, apparently despite such an action, angina pectoris may result. Further, it does not follow that the decrease in coronary flow reported by the authors is due to coronary vasoconstriction. Other factors besides this influence coronary flow, and it is well known that reflexes will cause irregular heart action, usually in the form of extrasystoles, which can cause a decreased coronary flow. Experiments such as these cannot be taken to indicate that a reflex coronary constriction occurs by way of the vagi. Even if a coronary constriction does occur, which has not been demonstrated in these experiments, the constriction must be through the sympathetic nerves, which we have found in our laboratory are the only ones that carry coronary vasoconstrictor fibers. In the vagi only coronary vasodilator fibers were demonstrated by us, and these were of the so-called cholinergic variety, the action of which could be abolished by atropine. In short, care must be taken in interpreting changes in coronary flow as indicative of active changes in coronary caliber.

DR. W. W. HAMBURGER, Chicago: The authors of this paper no doubt know of the work of Dr. W. J. Kerr, of San Francisco, who believes that a supporting abdominal belt will prevent episodes of pain in certain patients with lax abdomens who are suffering with angina pectoris. It seems to me that Dr. Kerr's view conflicts with the conclusions reached in this report. I should like to ask how Dr. Gilbert and his associates reconcile their work with his. As a clinician, I find myself confused on whether to advise such a patient to loosen his vest or to wear a supporting belt.

DR. G. V. LEROY, Chicago: In answer to Dr. Hamburger's question: We have wondered about the same thing ourselves. We feel that we have discharged our duty on this occasion by elucidating one mechanism and that only confusion would result if we attempted to explain every divergence that may occur. In answer to Dr. Katz, there are so many differing results reported by workers in cardiac physiology that it would be foolish to try to explain another worker's conclusions which differ so radically from our own.

The Heart in Diabetes

DR. THOMAS ZISKIN, Minneapolis: That heart complications occur in diabetes mellitus is well known. How soon heart involvement occurs and under what conditions have not been definitely proved. A study of the heart was made in a group of ninety-six veterans admitted to the hospital for the treatment of diabetes. Comparisons were made with a control group of patients with conditions other than cardiac. It was deemed significant that 46 per cent of the diabetic group showed abnormal electrocardiographic signs indicative of heart involvement and also that these abnormal signs occurred in a large percentage of the patients in whom the diabetes was first discovered on admission or had existed for one year or less.

DISCUSSION

DR. PAUL S. BARKER, Ann Arbor, Mich.: Dr. Ziskin has pointed out some features in the group which would probably be placed in the so-called adult type of diabetes. In diabetes in older people the cardiac abnormalities are common, and they are usually those of arteriosclerosis. It was of interest that changes were so common among patients whose diabetes was of approximately one year's duration; it would be of interest to reconcile this observation with the one that so many of the patients who have had diabetes for six years or longer did not show changes. The slurring as shown in some cases, I suspect, was so slight as to be of doubtful significance. Left axis deviation if pronounced can be considered definitely abnormal. Extrasystoles need not be taken as evidence of heart disease.

DR. THOMAS ZISKIN, Minneapolis: In this series the extrasystoles, although they are mentioned in the observations, were not considered of any comparative clinical value. The comparisons were made on the increase of slurring of the QRS complex and the other definite features of coronary disease. It is true that some of the slurring is very mild, but the same criterion for slurring of the QRS complex was used in the control group, and the fact that even the mild slurring was not present in the control group would indicate that this sign may be of some significance. This study brings to our attention the

fact that these electrocardiographic signs occurring early in the course of diabetes indicate that one must be on the lookout for coronary changes in the heart very early and must direct treatment accordingly.

Exercise Tolerance of Dogs After Coronary Occlusion

DRS. HOWARD BURCHELL and A. R. BARNES, Rochester, Minn.: The exercise tolerance of dogs has been studied after sudden and chronic coronary occlusion. Animals that have recovered from acute myocardial infarction have shown no decrease in ability to exercise. It has also been possible to occlude gradually the three major vessels in the dog's heart without the production of infarction and without demonstrable cardiac disability. Injection studies have shown the numerous potential anastomoses between the coronary vessels and the large anastomotic channels developing after coronary artery constriction and occlusion. Tissue grafts to the heart have not influenced the tolerance of animals for exercise.

DISCUSSION

DR. WARREN B. COOKSEY, Detroit: We have seen today two beautiful pieces of fundamental research in the problem of coronary disease. During the last few years I have had opportunity to see and be with two of my friends who have had severe cardiac infarcts. One does everything I tell him not to do, and he has shown no ill effects. I have been with the other in camp and I have been astounded at his tolerance to properly controlled exertion, though his infarction was extreme. It is, of course, common knowledge to all who see a good deal of coronary occlusion that many patients obtain a high degree of recovery. In spite of these facts and the demonstration we have just seen, one should clearly distinguish between properly controlled exertion and the more unusual or extreme forms of exertion, which can effect physiologic and pathologic changes conducive to thrombus formation. In a significant, though not large, number of cases coronary occlusion actually occurs within a few hours after an acute strain of unusual degree, a fact which must not be confused with Drs. Burchell and Barnes' experiments.

DR. LOUIS KATZ, Chicago: The method used by the authors for studying the exercise tolerance of the dog in coronary occlusion is logical. During the past week I have seen a dog in which a spontaneous infarction of the left ventricle developed, as shown by autopsy. After this the animal had discomfort and severe dyspnea, and an hour before death pulmonary edema could be demonstrated. This experience suggests that the dog, like man, shows evidence of cardiac strain in the manner postulated by the authors.

DR. A. R. BARNES, Rochester, Minn.: It is apropos in connection with this demonstration to recall some valuable work by Oberhelman and Le Count, who were studying the possibilities of demonstrating the connection between the right and left coronary arteries in both normal and diseased hearts. In many cases they found that they could carry the injection of one coronary over into the other side. In other words, those apparently normal persons have a coronary circulation that permits blood to pass from one artery to another. They believed that such a person could stand attacks of coronary thrombosis well. If they selected hearts subjected to chronic coronary disease and gave them injections, a good many would show the injection passing from one artery to the other. They believed that such a patient would probably survive and that the survival would be followed by healing with scar formation. I think the demonstration here, showing that after chronic occlusion it was possible to ligate a coronary artery with a low mortality rate but without much scar and permitting the dog to undergo normal exercise, has a real clinical bearing.

DR. FRED SMITH, Iowa City: The present study is of interest in connection with recent observations by Schlesinger, who demonstrated that even in the presence of multiple occlusion of the coronary arteries it might be possible to make a fairly complete injection of these vessels. Thus the results from the experimental study reported are comparable to what may be found in man. Therefore it would seem that the ability of an individual to withstand coronary artery disease depends on the extent of the collateral circulation and that this has a significant influence on the character and type of clinical manifestations.

DR. EDWIN F. HIRSCH, Chicago: The postmortem examination of patients who have died with coronary diseases demonstrates that the coronary artery lesions are usually in the first portions of the vessels. Beyond the constriction, the vessels are widely patent. Therefore the peripheral portions are able to dilate in the compensatory collateral circulation.

Chemistry of Atherosclerosis: Lipid and Calcium Content of Intima and Media of the Aorta With and Without Atherosclerosis

EDWIN F. HIRSCH, M.D., and SIDNEY WEINHOUSE, Ph.D., Chicago: The lipid and calcium contents of media tissues from human aortas increase with age. The increase is not correlated with the degree of intima atherosclerosis. Intima tissues without lesions have larger amounts of lipid and smaller amounts of calcium than the corresponding media tissues.

With increasing severity of the atherosclerotic lesions of the intima the proportions of free and combined cholesterol increase until the onset of necrosis; then the proportion of the combined cholesterol decreases. Also there are increased proportions of ether-insoluble phospholipids and calcium, and decreased proportions of the ether-soluble phosphatides, galactosides and fatty acids. The proportions of the individual lipid constituents in the intima and in the simple fatty deposits of the intima correspond closely with the analysis reported for these substances in blood plasma. These relations imply that the lipid deposits in the intima are the result of nonselective infiltration and precipitation of lipids from the plasma of the blood.

DISCUSSION

DR. EDWIN F. HIRSCH, Chicago: The point of view may be clarified by saying that two factors, the lipid and the tissue, are involved in this study. The earliest deposits of lipid in the aorta occur around the openings of the intercostal vessels and at other special places. Whether it is tissue structure or motion is not known, but something occurs in these places that unstabilizes the lipid material and leads to the separation of the lipid substances. The stability of the dispersed lipid material also may vary.

Relation of Arteriovenous Nicking to Enlargement of the Heart in Ambulatory Patients with Hypertension

DRS. SAMUEL A. SHELBURNE, J. LEEPER HAWLEY and A. S. MCGEE, Dallas, Texas: We were able to show by this study of 320 ambulatory cases of hypertension that arteriovenous nicking is a late sign in this condition and that enlargement of the heart occurs at about the same time arteriovenous nicking appears, with but few exceptions. This clinical rule is so nearly constant that, if the nicking is present and the heart is enlarged, it may be assumed that the enlargement is due to hypertension, even though the blood pressure is not elevated at the time of the examination. On the other hand, if enlargement of the heart is present in a hypertensive person and arteriovenous nicking has not appeared, one may with reasonable certainty assume that there is another cause for enlargement, such as coronary, syphilitic or rheumatic heart disease. Long experience has shown that arteriovenous nicking does not occur except in hypertensive states and that it is the most reliable retinal sign of hypertension.

This study is based on a careful examination, by the senior author, of each branch of the retinal artery of both eyes in these 320 cases of hypertension, and a concomitant teleoroentgenogram, as well as a careful history and physical examination, an electrocardiogram, urinalysis and Kline tests. Of the group of patients that had arteriovenous nicking, enlargement of the heart was present in 97.3 per cent. The exceptions were studied in greater detail. In the group of hypertensive patients who had no nicking (seventy-three cases) there were four (5.4 per cent) who had enlargement, and no cause other than hypertension could be found. Two of these had questionable enlargement, as they had unusual body formations and measurement of the heart size was not reliable. We also studied heart size in relation to early arteriovenous nicking. The results were not as definite as would be expected, but they are of considerable interest. The relation of these arterial changes to glomerulonephritis has also been studied.

DISCUSSION

DR. ROY W. SCOTT, Cleveland: It has been known for many years that retinal arteriosclerosis almost always occurs in vascular disease with hypertension and that therefore an ophthalmoscopic examination affords valuable evidence from both the diagnostic and the prognostic standpoint. Appreciating the very capricious distribution of human arteriosclerosis, I question that one is justified in correlating arteriovenous nicking with cardiac enlargement as closely as Dr. Shelburne has done. The inference is made that all patients who exhibit this nicking have cardiac enlargement demonstrable by x-rays and that one does not encounter cardiac enlargement in hypertensive patients without the nicking. Such close association between heart size and retinal vascular changes is not observed in many cases of essential hypertension.

DR. LOUIS LEITER, Chicago: While the authors have collected fine clinical data, I agree with Dr. Scott that they have not drawn entirely correct conclusions. The authors were surprised to notice 35 per cent of patients with enlarged hearts who had no retinal arteriovenous nicking. It is not surprising if one remembers that, in general, it takes longer for arteriovenous nicking to develop than for cardiac enlargement. Of course if the patient has both features at the first examination it would be difficult to decide which came first without considerable additional information. It is important to attempt to correlate the eyeground changes with changes elsewhere in the body because some of the conclusions drawn from these observations may have a bearing on theories of the etiology of essential hypertension.

DR. SAMUEL A. SHELBURNE, Dallas, Texas: When one attempts to make clinical correlations of varying factors, one is open for criticism. If any one does not believe that when there is arteriovenous nicking there is going to be enlargement of the heart, I will not accept his opinion until he has made as careful a study as we have. It has been asked What is the practical usefulness of this work? If one knows the relation between these changes and the size of the heart, if one knows what this factor of arteriovenous nicking means in terms of enlargement and if my statement is true, then it becomes practical: If a patient has nicking and enlargement of the heart, one knows that the enlargement is due to hypertension, a sound reason for enlargement of the heart. Dr. Leiter says that enlargement of the heart occurs before arteriovenous nicking. We do not know that.

Effects of Intravenous Solutions Given to Patients With and Without Cardiovascular Defects

DRS. FARNIS D. MURPHY, JOHN GRILL and HOWARD CORRELL, Milwaukee: Our purpose in this investigation was to determine the effect of giving intravenous solutions on the cardiovascular systems of patients with and without heart disease. In determining the capacity of the cardiovascular system to make adjustments for the added fluids, the following routine procedures were employed: In addition to the usual clinical observations of the venous pressure, the circulation time, the vital capacity and the blood and plasma volumes were determined. Also hematocrit studies, blood counts, the minute volume of the urine output, hemoglobin determinations and electrocardiographic studies were made. These estimations were done before fluids were administered and repeated every fifteen to thirty minutes for from six to twenty-four hours. The patients were weighed before and after the observations. A total of eighty-three patients were studied. There were fifty-three cardiac patients, of whom twenty-one belonged to grade 3, twenty to grade 2B and twelve to grade 2A according to the classification of the American Heart Association. The fluids used for investigation consisted of isotonic and hypertonic solutions. A comparison between the effects of the larger volumes and of smaller amounts was made. A correlation between the various results of the procedures employed and an interpretation of them in view of the clinical condition of the patient were attempted.

DISCUSSION

DR. WILLIAM S. MIDDLETON, Madison, Wis.: This paper is timely. Many surgeons and urologists have come to believe that they must "hydrate" their patients. It is true that the patient may need fluids under certain circumstances, but when confronted with clinical experiences of the following order one is apt to be more conservative. There is the patient who had an operation

and it was recommended that she receive 500 cc. of 5 per cent dextrose intravenously. By mistake 500 cc. of 50 per cent dextrose was given, and within a half hour's time there developed extreme dyspnea, cyanosis, pulmonary edema and engorgement of the liver. Fortunately the patient survived this harrowing experience. Another patient on whom necropsy was done in our institution had had on the recommendation of a member of the staff 11,150 cc. of fluid in two and a half hours. I do not cite this circumstance in criticism of this confrère alone but to show what can happen if physiologic principles are neglected. It is obvious that crystalloids in solution can be poured into the circulation at a speed at which the patient is unable to care for them. Obviously if one utilizes a 50 per cent solution one brings in ten times the amount of fluid administered. Whenever substances of this kind are given, one should bear in mind the relativity tonicity of the solution used. The hypertonicity of intravenous infusions and the rate of their administration are the important factors in determining cardiac overstrain in this connection. (Colloidal suspensions are not included in this discussion.) In this very concrete problem the internist must consult with the surgeon for the protection of the patient.

DR. ELMER DEGOWIN, Iowa City: I have observed with increasing alarm the practice of giving large amounts of fluids intravenously. This same study can be applied to transfusions of blood as well as to injection of saline solution and dextrose. Years ago Plummer reported six instances of fatal pulmonary edema following blood transfusions in cases of heart disease. We have observed two such instances, one patient having chronic nephritis and the other subacute bacterial endocarditis. Both died within an hour after transfusion. I have seen one other striking case: 800 cc. of dextrose-blood mixture given in the jugular vein to an infant weighing $7\frac{1}{2}$ pounds (3.4 Kg.); in two hours the baby became cyanotic, and in spite of venesection he died within thirty-six hours. At necropsy the heart was dilated, the lungs were congested but not edematous and there was generalized congestion in all tissues.

Pulmonary Edema: Its Roentgenologic Appearance in Acute Glomerulonephritis Without Signs of Cardiac Failure

DRS. THORNTON SCOTT, Lexington, Ky., and RICHARD SCHATZKI and WALTER BAUER, Boston: The roentgenologic picture of pulmonary edema was described and a brief review of the literature was given. Certain features which distinguish it from that of pulmonary stasis in congestive cardiac failure were outlined. Two cases of acute glomerulonephritis with roentgenologic evidence of pulmonary edema were presented in which there was no discernible background of myocardial failure. Two other cases with definite clinical and roentgenologic signs but with less certain pathogenesis were presented for comparison. There was a discussion of recent concepts of the pathogenesis of edema of the lungs. The importance of recognition of the latent or early forms roentgenologically was stressed, that unnecessary treatment may be avoided.

Hypertension and Unilateral Renal Disease

DRS. NELSON W. BARKER and WALTMAN WALTERS, Rochester, Minn.: Four cases were reported of unilateral chronic pyelonephritis with considerable atrophy of the affected kidney but no evidence of disease of the opposite kidney. In each of these cases hypertension had developed after the renal disease was well established. Careful studies of the blood pressure were made before and after nephrectomy, and reexaminations of the patients (sixteen months later in the first case, six months later in the second case, twelve months later in the third case and thirteen months later in the fourth case) showed that the blood pressure had returned to normal after operation and had remained within normal limits.

DISCUSSION

DR. LOUIS LEITER, Chicago: The problem presented by these cases is on the whole relatively simple, in that one is usually dealing with a unilateral renal disease in young people with normal function on the uninvolved side. Secondly, the duration of the hypertension has not been long enough to result in development of organic vascular disease in the other kidney. It seems that the renal pressor mechanism is released more easily in man than in the dog and requires much less kidney tissue to maintain

the hypertension. The exact amount of ischemic renal tissue necessary to bring about this reaction, or the quantitative aspect of the balance between the normal and the atrophic kidney, apparently varies from species to species. It should be emphasized that these relatively simple clinical cases are rare. I was pleased to hear that Dr. Barker still thinks there is such a thing as "essential" hypertension. Surgical treatment of patients, particularly in the older age groups, with active or old pyelonephritis in one kidney but with some reduction of function in the other kidney is difficult. I would urge caution in deduction as to the ultimate outcome of the operation unless the patients have been followed for a year or two after operation, especially those over 40. It is possible that in some of them hypertension will redevelop.

DR. NELSON W. BARKER, Rochester, Minn.: As Dr. Leiter indicated, it is probable that the development of hypertension in these cases depends on the amount of destruction of renal tissue. We do not have sufficient evidence to say that any localized renal lesion, no matter how small, may be responsible for the production of hypertension. It is also well to point out that, even if it is the result of unilateral renal disease, hypertension which has existed for a long period may not disappear after nephrectomy, since irreversible organic changes may have developed in the arterioles throughout the body. In a case of hypertension with one badly diseased kidney and one slightly diseased kidney, considerable clinical judgment is necessary to determine whether the bad kidney should be removed. I believe that this should depend on how bad the hypertension is and on how long it has existed. I do not think that age alone is a contraindication to surgical treatment provided the patient is otherwise in good physical condition.

A Simplified Inulin Clearance Test for Measurement of Glomerular Filtration Rate

DRS. BENJAMIN F. MILLER and ALF S. ALVING, Chicago: Our previous experiments have demonstrated that the inulin clearance at low plasma levels is an adequate measure of the glomerular filtration rate in normal, nephritic and hypertensive individuals. On the basis of these results and by employing a sensitive colorimetric method for the determination of inulin (Alving, Rubin and Miller), we have devised a simplified practical procedure whereby the glomerular filtration rate can be determined in the clinic. The measurement of the glomerular filtration rate permits one to make precise estimates of the changes that have occurred in specific functions and anatomic sections of the nephron.

DISCUSSION

DR. NORMAN M. KEITH, Rochester, Minn.: Drs. Alving and Miller have developed a new, accurate micromethod for the estimation of inulin, only a small injection of which is necessary to determine glomerular filtration rate or clearance. Their results in a small number of cases agree with results of those who have previously used inulin. I should like to remind the authors that the actual number of filtering glomeruli in chronic diffuse nephritis may not give one the true picture as to the available renal function. Oliver's reconstructions of different nephrons from chronically diseased kidneys show that there may be relatively much greater hypertrophy of the tubule than of the glomerulus; in some nephrons with enlarged tubules the glomerulus may even be absent. These anatomic facts of Oliver and functional results presented by Drs. Alving and Miller emphasize the importance of correlating function with structure. I am sure we all agree that such correlation is a major objective of clinical research.

DR. EMMET B. BAY, Chicago: I should like to ask the authors if one could use a factor of six times the inulin clearance rate to get the blood flow through the kidney in cases in which the inulin clearance is 2 per cent of normal.

DR. ALF S. ALVING, Chicago: We have not used this test in chronic pyelonephritis. I do not know whether Dr. Smith has done so, but it should be done. As regards renal flow, the normal flow is six times the glomerular filtration rate. Some workers have found that in essential hypertension the spasm of the afferent arterioles causes the filtration of a larger percentage of inulin by causing a back pressure in the glomerulus. Whether this holds for glomerulonephritis is not known.

The actual renal blood flow is perhaps a great deal higher, and we use the term "effective renal blood flow" for that reason to designate the blood flowing through actively functioning nephrons.

A Crystalline Pressor Substance, Angiotonin

IRVINE H. PAGE, M.D., and O. M. HELMER, Ph.D., Indianapolis: When renin prepared by the method of Helmer and Page (1939) is allowed to react with renin activator (Kohlstaedt, Helmer and Page, 1939), a strongly pressor substance is produced which we have called "angiotonin." It is dialyzable, heat stable and alkali sensitive. Crystalline derivatives such as picrates and oxalates have been prepared. Incubation of renin with angiotonin destroys the latter; hence angiotonin is an intermediate product. It is somewhat similar to epinephrine and tyramine in its effect on blood pressure but exhibits few of their other properties. It is suggested that renin is an enzyme—not a pressor substance—which acts on a substrate (renin activator) to produce a pressor substance, angiotonin.

DISCUSSION

DR. GEORGE WAKERLIN, Chicago: Since the authors found that angiotonin increases the tone of the intestinal strip in vitro, if angiotonin is the effective pressor substance in experimental renal hypertension why is there no evidence of altered bowel motility in dogs with this type of hypertension? Moreover, if renin on intravenous injection exerts its pressor effect through producing angiotonin, as claimed by the authors, why is there no significant change in the tone or motility of the bowel when renin is injected intravenously in dogs in a dose sufficient to raise the blood pressure significantly?

DR. IRVINE H. PAGE, Indianapolis: The responses of intestinal strips in a bath may not be comparable with the responses in the intact animal. Renin itself produces no response in vitro simply because no activator is present. In answer to Dr. Wakerlin's second question, the concentrations of angiotonin used to cause contraction of the intestine in the bath are far greater than those required to produce pressor effects in the intact animal. If this reasoning is correct, much larger doses of angiotonin would be required to produce hypermotility of the intestine than to produce hypertension in the body.

Comparative Analysis of the Effects of Cold and Thyrotropic Substance on the Thyroid Gland

PAUL STARR, M.D., and RIGBY ROSKELLY, B.S., Chicago: Numerous workers have shown that there is hyperplasia in the thyroid of guinea pigs and rats which have been exposed to cold. Groups of rats were kept in an ice refrigerator under controlled conditions for three, seven, fourteen, eighteen, twenty-one, thirty-five, forty-five and fifty-six days. In all, seventy-five animals were used. The thyroid was then removed and prepared for microscopic study. The microhistometric method of Starr and Rawson was used to measure the degree of hyperplasia. Control animals living at room temperature had a mean thyroid cell height of 5.19 microns. After seven days in the cold the mean had risen to 5.97 microns, at fourteen days the mean was still only 6.10 and at twenty-one days it was 8.15 microns. After this time the cell height declined to 6.40 microns at fifty-six days. This curve thus has an early low plateau, an additional rise after fourteen days and a gradual fall, i. e. a complex concave curve. In comparison, the curve of cell height response to increasing doses of thyrotropic substance in guinea pigs shows early acceleration and gradual approach to a maximum response, i. e. a simple convex curve. This suggests different mechanisms of thyroid stimulation.

DISCUSSION

DR. ALLAN KENYON, Chicago: These observations are similar to my own of some time ago. There are big differences in response between various individuals, which may depend in part on the amount of iodine available in the diet. In my experience iodine inhibited the reaction to cold. I am looking forward to seeing what the authors will find when they use iodine and measure cell height by their exact technic. Not only did colloid accumulate under the influence of iodine in my experience but the cell height appeared to decline. This relationship is troublesome. In animals with simple goiter one

sees great cell height and a low basal metabolic rate; then after iodine has been given the basal metabolic rate may increase sharply but the cell height declines and colloid accumulates. Of course in man with intense hyperthyroidism there are usually tall thyroid epithelium and depletion of colloid, but there are many variations and the reverse may occur. It seems therefore that cell height itself is an insufficient general indicator of the amount of hormone delivered to the body. This particular experimental circumstance seems to be one of the very few in which one has reason to believe that there is increased thyroid secretion and in which the physiologic chain of events seems to be normal. Therefore it is essential to continue its careful study in the hope of finding out more about this mechanism of normal thyroid stimulation.

DR. WILLIAM S. MIDDLETON, Madison, Wis.: I wish to recall the work of Tatum on the influence of environmental temperature on the activity of thyroxine. According to most textbooks thyroxine has a period of latency of about twenty-four hours. If the rabbit is placed in an environment above the temperature of the body, the effect of thyroxine may be speeded so that within half an hour to an hour these effects may be manifested on the circulation and respiration. If, contrariwise, the animal is placed in a cold environment with the temperature below that of the body there will be a prolongation of this latent period. I believe that we all appreciate that patients with thyrotoxicosis are much better off in cold than in warm weather and, from a practical point of view, I believe the implication is clear.

DR. MOSES BARRON, Minneapolis: I should like to ask whether there was a real hyperplasia present or only a simple hypertrophy. From the lantern slides it looked to me as if there was no actual increase in the number of cells but simply a hypertrophy present. If there should be an actual increase of cells in the acini, papillary projections would develop. The histologic picture suggests an attempt at increased function which did not progress to the point of an actual hyperplasia.

DR. E. PERRY McCULLAGH, Cleveland: Any one who has had experience with bio-assay methods realizes that the ideal bio-assay is not yet at hand. The method used by the authors appears to be excellent for the assaying of thyrotropic hormone. I should like to emphasize one point with regard to the paper, namely that the degree of cell change in the thyroid is not the equivalent of hyperthyroidism. I believe that the authors do not wish to imply this, but I should like to have them express themselves definitely on this point. In this regard it may be worth pointing out that in untreated animals large thyroid glands may be seen which present a microscopic picture identical with that found in the human being in the presence of severe exophthalmic goiter, and yet the animal may have no evidence of hyperthyroidism in the ordinary sense of the word. It is clear, therefore, that the size of the cells lining the acini does not necessarily parallel the amount of hyperthyroidism present.

DR. PAUL STARR, Chicago: We have done some work on the administration of iodine after the hypertrophy has taken place with a resultant recession within ten days. I am glad to get Dr. Middleton's reminder of Tatum's work. It may be that the Tatum animals have a modified status of their own thyroid and therefore respond differently to the administration of thyroxine. With regard to Dr. Barron's question, we do not know whether there are any more cells or less, and, in response to Dr. McCullagh's remarks, we have avoided trying to make any comparisons with clinical hyperthyroidism. This method opens up the possibility of making a quantitative study of thyroid response to demand. We can study protection by nutritional factors, including iodine, vitamins, minerals, proteins and other elements of the diet, and we can study the effect of modification of the physiologic, anatomic relationships of the thyroid, as has been done by other observers. The superiority of this setup over the work recently done on cold is that we have a condition in which we are studying the response over a long period and we have an accurate means of measuring the microscopic changes. Animals thrive in this environment; in the other work they died in six or seven days.

(To be continued)

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Ophthalmology, St. Louis

22: 1321-1432 (Dec.) 1939

Prophylactic and Therapeutic Effect of Bacteriophage and Antivirus in Experimental Staphylococcal Infection of Eye. J. Bronfenbrenner and S. E. Sulkin, St. Louis.—p. 1321.

Note on Immunology of Trachoma. L. A. Julianelle, St. Louis.—p. 1326.

*Vitamin D Complex in Progressive Myopia: Etiology, Pathology and Treatment: Preliminary Study. A. A. Knapp, New York.—p. 1329. Unilateral Loss of Vision in Neurologic Disease. P. J. Leinfelder, Iowa City.—p. 1337.

*Asthenopia Due to Vitamin A Deficiency. F. C. Cordes and D. O. Harrington, San Francisco.—p. 1343.

Dermoid (Oil) Cyst of Orbit: Report of Case. W. E. Borley, San Francisco.—p. 1355.

Neuromyelitis Optica: Report of Case. A. G. Athens, Duluth, Minn.—p. 1360.

Tetanus and Prophylactic Use of Antitoxin Following Injuries of Eye. D. G. Cogan, Boston.—p. 1365.

Intra-Ocular Foreign Bodies: Some Comments Based on 120 Cases. E. S. Sherman, Newark, N. J.—p. 1368.

Visual Acuity Tests. S. S. Blankstein, Milwaukee, and Mary Jane Fowler, Chicago.—p. 1377.

Rhinosporidium of Conjunctiva: Case. W. B. Anderson and T. H. Byrnes, Durham, N. C.—p. 1383.

Rhinosporidiosis: Case Report. E. W. Griffey, Houston, Texas.—p. 1389.

Effect of Tartar Emetic on Course of Trachoma: Second Report. L. A. Julianelle, St. Louis; J. F. Lane, Albuquerque, N. M., and W. P. Whitted, Gallup, N. M.—p. 1390.

Vitamin D Complex in Progressive Myopia.—Knapp selected fifty-three patients because it was believed that their myopia would progress. Their age varied from 3 to 20 years. Their myopia ranged from —0.25 to —41 diopters. Vitamin D and calcium were prescribed. The dosage of the latter varied with the milk intake. For each glass of milk less than a quart two tablets of the calcium were added. Of the fifty-three patients, insufficient data were obtained on seven. Of the remaining forty-six, only twelve patients took their medication regularly. Six of these twelve showed a reduction in their myopia, two remained stationary and four progressed. Considering the forty-six patients without regard to the regularity of medication, sixteen had a reduction in their myopia, seven remained stationary, twenty-one progressed and two displayed a decrease of myopia in the left eye and a progression in the right. In other words, 66% per cent of the patients who had medication either manifested a reduction in their myopia or remained stationary. It appears to the author that a disturbance in the vitamin D calcium-phosphorus metabolism is concerned in the etiology of myopia. In the presence of a calcium imbalance there may be a weakening of the fibrous tunic, which may give rise to myopia. Once a condition of progressive myopia has been established, treatment with the vitamin D complex is indicated. The myopic eyes that respond to this therapy may undergo an actual shrinkage of the globe. For the prevention of the onset of myopia, the vitamin D complex probably has another field of usefulness. Given a patient showing a diminishing degree of hyperopia and one who is approaching the axial myopia side, it would be well to fortify his diet with vitamin D and calcium. Assuming a disorder of the vitamin D complex metabolism to be a basic factor in the etiology of myopia, the author believes that the rarity of myopia in the American Indian, the fact that the rural inhabitant is freer from this complaint than the one residing in a city, that fewer myopic eyes are found in high altitudes and the prevalence of myopia in China are readily explained. Greater food consciousness, especially in relation to vitamin supply, explains why fewer cases of progressive myopia are seen today.

Asthenopia Due to Vitamin A Deficiency.—Cordes and Harrington observed eighty-two private patients between 13 and 78 years of age with persistent asthenopia in whom, as indicated by the biophotometer, there was a deficiency in vitamin A. Treatment was instituted only after sufficient time had elapsed to obtain all possible relief from the correction of the usual causes of asthenopia. In some the symptoms were so suggestive of vitamin A deficiency that the biophotometer reading was taken at the initial examination; in the majority, however, it was obtained when the patient returned, after a month or longer, complaining of persisting symptoms. Photophobia and sensitivity to glaring lights frequently accompany avitaminosis A and 69 per cent of the patients complained of being light sensitive. Aside from this there were certain characteristic symptoms complained of consistently. Of the patients 16 per cent were conscious of the eyes and uncomfortable when using them, 11 per cent complained of headache or blurring while driving, and approximately the same number had difficulty when viewing the movies. Seven patients had marked symptoms of asthenopia to the extent that they were unable to use their eyes. In a few instances headache when using the eyes was the principal complaint. The biophotometer readings before treatment was instituted ranged between 0.7 and 4.2 millifoot candles, the average being 2.09. If Jegher's normal of 0.75 millifoot candle is accepted, the average of 2.09 is low. After treatment and before discharge the average reading had been brought up to 0.9 millifoot candle. In only 22 per cent of the cases was it possible to obtain a history of any degree of night blindness. A history of dietary deficiency was obtained in 31 per cent of the cases. For treatment carotene in oil capsules were used. In the majority of cases 30,000 units (one 10,000 unit capsule three times a day) was given daily for a period of one month and then the biophotometer reading was repeated. With this and the subjective symptoms as a guide the carotene was continued or reduced in amount until an apparent balance was obtained. If carotene is absorbed faster from the intestinal tract than the liver can convert and store it, this surplus causes a yellow color (carotenemia) to appear in the body. It is not dangerous and disappears promptly when the carotene intake is reduced. Following carotene therapy 79 per cent of the patients experienced complete relief from their symptoms, 12 per cent received partial relief and 9 per cent obtained no improvement.

American Journal of Physiology, Baltimore

128: 1-202 (Dec.) 1939. Partial Index

Attempt to Condition Gastric Secretion to Histamine. S. Katzenelbogen, R. B. Loucks and W. H. Gannt, Baltimore.—p. 10.

Effect of Asphyxia on Reflex Inhibition. A. van Harreveld, Pasadena, Calif.—p. 13.

Study of Wallerian Degeneration. A. Rosenbluth and E. W. Dempsey, Boston.—p. 19.

New Results on Absorption of Insulin from Alimentary Tract. L. E. Young, W. A. Phillips and J. R. Murlin, Rochester, N. Y.—p. 81.

Effect of Various Conditions on Rate of Atrophy in Denervated Muscle. H. M. Hines and G. C. Knowlton, Iowa City.—p. 97.

Response of Brunner's Glands to Secretin. S. J. Fogelson and W. H. Bachrach, Chicago.—p. 121.

*Influence of Massive Doses of Insulin on Peripheral Blood Flow in Man. D. I. Abramson, N. Schloven, M. N. Margolis and I. A. Mirsky, Cincinnati.—p. 124.

Effect of Blood Flow on Potassium Liberation from Muscle. W. O. Fenn, W. S. Wilde, Ruth A. Boak and R. H. Koenemann, Rochester, N. Y.—p. 139.

Relative Cholinergic Effects of Selected Estrogens. S. R. M. Reynolds and Frances I. Foster, Brooklyn.—p. 147.

Effect of Chronic Cardiac Venous Occlusion on Coronary Arterial and Cardiac Venous Hemodynamics. J. J. Thornton and D. E. Gregg, Cleveland.—p. 179.

Studies on Increased Intracranial Pressure and Its Effects During Anoxia and Hypoglycemia. L. Yesinick and E. Gellhorn, Chicago.—p. 185.

Massive Doses of Insulin and Peripheral Blood Flow.

For determining the effect of massive doses of insulin on the peripheral circulation of seven patients with schizophrenia Abramson and his colleagues used the plethysmographic method. They state that a marked increase in blood flow was usually observed in the hand, forearm and leg at the height of the hypoglycemic response. When the hypoglycemia was terminated by the administration of carbohydrate a rapid decrease in blood flow to below the control level usually occurred, especially in the hand. When dextrose was given without the previous injection of insulin, this effect on the blood flow was not apparent.

It seems to the authors that conclusions relating to the metabolism of tissues based on changes in the chemical constituents of blood from these tissues are open to criticism, unless simultaneous blood flow studies are performed and correlated with the other data.

Archives of Neurology and Psychiatry, Chicago

43: 1-194 (Jan.) 1940

- Action Potentials of Muscles in "Spastic" Conditions. P. F. A. Hoefler and T. J. Putnam, New York.—p. 1.
- Results of Experimental Removal of Pineal Gland in Young Mammals. L. Davis and J. Martin, Chicago.—p. 23.
- Modification of Gudden Method for Study of Cerebral Localization. A. Brodal, Oslo, Norway.—p. 46.
- Studies in Multiple Sclerosis: Serum Enzymes. C. H. Richards and H. G. Wolff, with technical assistance of Marjorie Winegarten, New York.—p. 59.
- *Effect of Phenobarbital on Mentality of Epileptic Patients. Esther Somerfeld-Ziskind and E. Ziskind, Los Angeles.—p. 70.
- Relation of Ventricular Asymmetry to Contracting Intracranial Lesions. J. S. Robertson, Glasgow, Scotland, and A. E. Childe, Montreal.—p. 80.
- Relation of Anoxemia to Early Activity in Fetal Nervous System. W. F. Windle and R. F. Becker, Chicago.—p. 90.
- *Clinical Study of Anxiety Attacks. H. L. Kozol, Baltimore.—p. 102.
- Congenital Demyelinating Encephalopathy. R. P. Mackay, Chicago.—p. 111.
- Probable Topographic Relations of Sleep-Regulating Center. J. H. Globus, New York.—p. 125.

Effect of Phenobarbital on Mentality of Epileptic Patients.—Somerfeld-Ziskind and Ziskind think that the hazards of phenobarbital are often overemphasized. Among 600 cases of convulsive states, large doses of phenobarbital were often necessary to keep patients free from seizures, yet they never encountered an instance of serious idiosyncrasy to the drug. Mental deterioration does occur in a variable percentage of epileptic patients, and it is conceivable that chronic intoxication with drugs may be partly responsible. However, most of the pertinent statements in the literature are conjectural. The authors subjected the matter to investigation, since they could discover no controlled study as to the effect of phenobarbital on the sensorium. One hundred noninstitutionalized epileptic patients composed their series. After thorough diagnostic studies the patients were given six psychologic tests, including the Stanford-Binet test. The mean intelligence quotient was 93, seven points lower than the generally accepted average for a normal community. In the cases of cryptogenic epilepsy the average intelligence quotient was 97, but in those of the symptomatic type it was only 88. Most mental traits were normal except memory, attention and language ability, which were somewhat deficient. Tests containing primarily motor elements gave lower scores than was anticipated. The reaction time in free association tests was slower than for normal persons. Patients treated with phenobarbital showed a marked reduction in the number of spells. In all, 79 per cent of forty-eight patients given phenobarbital for a year were either free from attacks or definitely improved. The treated patients, although more severely afflicted at the outset, had only 20 per cent as many convulsions as did the controls during the trial year, and only 15 per cent as many petit mal attacks. Psychologic tests performed before and after one year of treatment with phenobarbital showed no impairment in the mentality of forty-eight epileptic patients. The control group of forty-two epileptic persons likewise did not deteriorate. Seven patients were tested before and after two years of phenobarbital therapy. On the whole, the slight changes after two years of treatment were in the direction of normality. In thirteen cases the first year was used as a control and phenobarbital was given throughout the second year. There was some improvement in performance with the psychologic tests after the year of treatment. This study indicates that phenobarbital in doses of $1\frac{1}{2}$ grains (0.1 Gm.) two or three times a day can be given for two years without resultant deterioration of the intellect.

Study of Anxiety Attacks.—Acute attacks of anxiety were the principal feature of the forty-eight cases on which Kozol based this study. The age at onset of the attacks was under 30 in thirty-three cases. In all cases circumscribed attacks were present. Forty-one of the patients spontaneously used the word "fear" in describing how they felt. In every instance the fear related to an imminent personal catastrophe of the patient himself. All but one of the patients emphasized disturbing bodily

states. More than half did not show the full picture of physical symptoms described in anxiety attacks; namely, palpitation checking, dry mouth, cold sweat, numbness of the extremities, epigastric discomfort and urge to defecate. In the majority of cases, however, the most common complaints were palpitation, choking and urge to defecate. These patients as a group lack insight into the possible relationship between the attacks of anxiety and apparently obvious situations. In scrutinizing their life situations, potentially disturbing factors appeared in all the cases. Threats of frustration of ambition were nearly as common and important as sexual factors. Personality traits characteristic of this group of patients are egotism, self centeredness, sensitivity to the opinions of others, ambitiousness, aggressiveness, intensity, apprehensiveness and anticipatory trends. In only four instances was there complete absence of personality imbalance in other members of the family. Treatment began with a search for the actual facts. When possible, practical help was given in changing the situation. Psychoanalysis was not systematically carried out in more than one case. Results of treatment were not dramatic. The attacks usually subsided while the patients were in the hospital. Twenty-eight of the patients have been followed up, one for twenty-three years. In all, improvement came with time, but few attained absolute freedom from attacks.

Archives of Ophthalmology, Chicago

22: 947-1172 (Dec.) 1939

- Clinical Detection of Early Changes in Visual Field. H. M. Traquair, Edinburgh, Scotland.—p. 947.
- Injection of Air as Factor in Maintaining Filtration After Corneoscleral Trephining in Glaucoma. J. A. MacMillan, Montreal.—p. 968.
- Retinal Detachment Cured by Eyeball-Shortening Operation: Report of Case. D. K. Pischel and Miriam Miller, San Francisco.—p. 974.
- *Effect of Anoxemia on Dark Adaptation of Normal and of Vitamin A-Deficient Subject. R. McDonald and F. H. Adler, Philadelphia.—p. 980.
- Malignant Melanoma So-Called Sarcoma of Uvea: II. Problems in Diagnosis. T. L. Terry, Boston.—p. 989.
- *Cataract Following Inhalation of Paradichlorobenzene Vapor. M. L. Berliner, New York.—p. 1023.
- Iridocyclitis in Glaucoma. E. L. Goar and J. F. Schultz, Houston, Texas.—p. 1035.
- Relative Sizes of Ocular Images of Two Eyes in Asymmetric Convergence. K. N. Ogle, Hanover, N. H.—p. 1046.
- The Myopia Problem. A. deH. Prangen, Rochester, Minn.—p. 1083.

Effect of Anoxemia on Dark Adaptation in Vitamin A Deficiency.—By a change in certain fundamental metabolic requirements, McDonald and Adler caused the normal dark adaptation curve to become altered. They first reduced the amount of oxygen in the circulating blood and during the period of anoxemia a temporary but significant upward displacement of the intensity curve by a factor of 2.5 ($\log I = 0.4$) was observed; that is, the rod and cone thresholds were both raised by an equal amount, but the rate of adaptation was apparently unchanged. A reduced dietary intake of vitamin A caused an unequal rise in the rod and cone thresholds, the rod threshold showing the greater variation. This suggests that even though anoxemia and vitamin A deficiency both change the character of the adaptation curve, they act on different processes in the visual cycle. The rise in threshold due to anoxemia is simply additive and is the same in the normal and in the vitamin A deficiency state. This is further substantiated by the fact that vitamin A deficiency does not alter the effect produced by oxygen lack. It is known that vitamin A is concerned with the photochemical basis of the visual response, and it is probable that anoxemia acts elsewhere in the visual system, i. e. on the nerve mechanism.

Cataract After Inhalation of Paradichlorobenzene Vapor.—Berliner cites two cases of jaundice, loss of weight and cataract formation in young women following exposure to paradichlorobenzene vapor for one and two years respectively. The history in each case suggests a toxic hepatitis due to continued exposure to the fumes of this moth-repelling drug. The changes in the lenses appeared as a delayed reaction several months after the patients were removed from the influence of the fumes of this drug, a phenomenon strikingly similar to that observed in cataracts due to the toxic effects of dinitrophenol. Paradichlorobenzene inhaled in sufficient concentration caused the death of guinea pigs and rabbits and produced vacuolation

and necrosis of hepatic cells, principally in the central portion of the liver lobule. No lenticular changes appeared except in one experimental rabbit which was fed the drug orally. The public should be warned of the toxic properties of this drug, manufacturers and distributors of the product should be required to label containers properly that are sold to the general public, and the medical profession and health authorities should be apprised of the danger of prolonged inhalation of the fumes of paradichlorobenzene.

Archives of Otolaryngology, Chicago

30: 863-1076 (Dec.) 1939

- Tonsillectomy: Local Results and Influence of Operation on Surrounding Tissues. E. H. Campbell, Philadelphia.—p. 863.
Nursing, Feeding and Parenteral Administration of Fluids. W. E. Grove, Milwaukee.—p. 872.
Transfusions of Blood in Care of Patients After Operations for Otitic Sepsis. J. M. Sutherland, Detroit.—p. 876.
Chemotherapy. T. C. Galloway, Evanston, Ill.—p. 901.
Simple Quantitative Method of Testing Vestibular Function. M. Atkinson, New York.—p. 916.
Structure of Petrous Portion of Temporal Bone, with Special Reference to Tissues in Fissular Region. B. J. Anson and J. G. Wilson, Chicago.—p. 922.
Congenital Cysts of Larynx: Report of Case. G. B. New and J. B. Erich, Rochester, Minn.—p. 943.
*Treatment of Otitic Meningitis. D. S. Cuning, New York.—p. 950.
Intranasal Dacryocystostomy. W. E. Sauer, St. Louis.—p. 973.
Chronic Progressive Deafness, Including Otosclerosis and Diseases of the Inner Ear. G. E. Shambaugh Jr., Chicago.—p. 999.

Treatment of Otitic Meningitis.—According to Cuning, attempts at treatment of otitic meningitis have been disappointing. Reports covering several thousand cases indicate mortality rates of from 95 to 98 per cent. In this paper Cuning describes the treatment and results in fourteen cases of otitic meningitis and in one case of meningitis following submucous resection. Only cases in which the pathogenic organism was actually recovered from the spinal fluid are included in this report. Treatment was similar in all cases, namely a combination of radical surgical intervention, daily spinal drainage and the intensive use of sulfanilamide or one of the related compounds. Blood transfusions and intravenous administration of dextrose were employed during the same period. In this series of fifteen consecutive cases of meningitis, eleven patients recovered and four died. Sulfanilamide, while obviously extremely important, is apparently not sufficient in itself to produce a cure. Surgical intervention in itself is not sufficient, and it seems that a combination of the two, namely sulfanilamide and surgical intervention, offers the best hope. In the use of the drug it is important that treatment be started early, that the dose be large and that the treatment be continued for several weeks after cessation of symptoms. Surgical measures likewise should be instituted as soon as the diagnosis is made. In seven of eight cases in which the invading organism was *Streptococcus haemolyticus*, recovery occurred. In two cases in which the organism was *pneumococcus* type I and one case in which the organism was *pneumococcus* type III, death occurred. Had sulfapyridine been known when the pneumococcal infections were treated, the results might have been better. Six patients showed paralysis of the external rectus muscle. It seems that with the use of sulfanilamide plus surgical intervention meningitis is not necessarily to be considered as formidable as formerly.

Archives of Pathology, Chicago

28: 777-944 (Dec.) 1939

- Influence of Androgens on Growth and Metastasis of Brown-Pearce Epithelioma. J. R. Murlin, C. D. Kochakian, C. L. Spurr and R. A. Harvey, Rochester, N. Y.—p. 777.
Aspiration Type of Congenital Tuberculosis. H. S. Reichle and M. C. Wheelock, Cleveland.—p. 799.
Subdural or Intradural Hemorrhages. T. Leary, Boston.—p. 808.
Origin and Significance of Binucleate Purkinje Cells in Man. W. Andrew, Dallas, Texas.—p. 821.
Cardiac Lesions in Rabbits Produced by Filtrable Virus (Virus III). J. M. Pearce, Brooklyn.—p. 827.
Effect of Potassium Iodide on Bone and Cartilage in Thyroidectomized Immature Guinea Pigs. M. Silberberg and Ruth Silberberg, St. Louis.—p. 846.
Role Played by Trauma in Dissemination of Tumor Fragments by Circulation: Tumor Studied: Brown-Pearce Rabbit Epithelioma. A. G. Ide, R. A. Harvey and S. L. Warren, Rochester, N. Y.—p. 851.
Histology of Thyroid in Exophthalmic Goiter and Hyperthyroidism. C. A. Hellwig, Wichita, Kan.—p. 870.

California and Western Medicine, San Francisco

51: 355-414 (Dec.) 1939

- Headaches of Chronic or Recurring Type: Considered from the Point of View of the Internist. D. L. Wilbur and L. R. French, San Francisco.—p. 362.
Headaches: From the Point of View of the Ophthalmologist. W. D. Horner, San Francisco.—p. 367.
Id.: From the Point of View of the Otolaryngologist. H. J. Cohn, San Francisco.—p. 369.
Unilateral Cerebral Dominance: Consideration of Some of Its Manifestations. K. O. Von Hagen, Los Angeles.—p. 371.
*Gallbladder: Its Relation to Chronic Arthritis of Uncertain Etiology. R. S. Peers, Oakland.—p. 374.
Endonasal Tear Sac Operation. B. L. Bryant, Los Angeles.—p. 376.
Mental Hygiene as a Department of Public Health Activity: Report of Study on 9,527 Cases. J. C. Geiger and Olga Bridgman, San Francisco.—p. 378.
Anesthetics: Plea for Accurate Rating. P. Campiche, San Francisco.—p. 381.
Hyperostosis Calvarii Interna: Its Clinical Significance. B. N. Tager, E. K. Shelton and W. C. Matzen, Los Angeles.—p. 384.
Management of Senile Patients for Anesthesia and Operation. W. Lawrence, San Francisco.—p. 388.

Gallbladder and Arthritis.—Peers studied the relation of the function of the gallbladder in seventy-one cases of chronic arthritis of unknown etiology. As revealed by the sodium tetraiodophenolphthalein test twenty-five patients had normally functioning gallbladders. On examination and questioning, ten of these patients gave no history of gastrointestinal complaints, fifteen complained of one or more of the usual symptoms of low grade indigestion and x-ray visualization of the remaining forty-six revealed stones or there was a marked variation from normal as to filling, concentration or emptying of the gallbladder. Four of the forty-six patients were reported as having gallstones and six as having no visualization of the gallbladder. Three of these six patients whose gallbladders did not react to the dye had a negative clinical history. Twelve of the remaining thirty-six patients who presented atypical observations had negative clinical histories in relation to their gastrointestinal tracts. Of the twenty-five patients reported as having normal roentgenograms twelve were considered to have arthritis of the rheumatoid type, eight osteo-arthritis and five of the mixed type. The arthritis of the forty-six patients reported with positive changes of the gallbladder was rheumatoid in thirteen, osteo-arthritis in thirteen and mixed in twenty.

Canadian Medical Association Journal, Montreal

41: 527-622 (Dec.) 1939

- Epilepsy and Cerebral Lesions of Birth and Infancy. W. Penfield, Montreal.—p. 527.
Inclusion Conjunctivitis. S. H. McKee, Montreal.—p. 535.
Bronchoscopy in Sanatorium. J. H. Holbrook and P. Rabinowitz, Hamilton, Ont.—p. 542.
Plastic Surgery at Seventy-Two. J. W. Gerrie, Montreal.—p. 548.
Nature of War Neuroses. C. K. Russel, Montreal.—p. 549.
Treatment of Pneumonia. M. Finland, Boston.—p. 554.
*Treatment of Paget's Disease by Adrenal Cortical Preparations. E. M. Watson, London, Ont.—p. 561.
Complications of Diabetes Mellitus, with Special Reference to Cause and Prevention. A. A. Fletcher and J. W. Graham, Toronto.—p. 566.
*Treatment of Hemangiomas of Skin in Children by Carbon Dioxide Snow. N. M. Wong, Toronto.—p. 571.
Neuropathies of Colon as Seen by X-Rays. M. C. Morrison, London, Ont.—p. 573.
Significance of Melena in Children. H. Little, London, Ont.—p. 575.
Acute Toxic Nephritis Due to Inhalation of Carbon Tetrachloride Fumes. M. A. Simon, Montreal.—p. 580.
Congenital Hemihypertrophy. H. H. McGarry, Niagara Falls, Ont.—p. 583.

Adrenal Cortex Extract for Paget's Disease.—Watson treated nine patients with Paget's disease of the bones with adrenal cortex extract. This was injected once a week into the gluteal muscles in amounts of from 5 to 10 cc. or more. In the majority of the patients there was undoubted clinical improvement, exemplified by cessation or lessening of the pain and by an increased sense of well being. Biochemical improvement occurred in all of the cases as indicated by a reduction of the serum phosphatase. In view of the favorable results which have accompanied the use of desoxycorticosterone acetate in Addison's disease, the author used this compound as a substitute for the cortical extract in some of the cases of Paget's disease. Also, a preparation of adrenal cortex designed for oral administration was tried in some instances. Injections of desoxycorticosterone acetate and the oral administration of the desiccated adrenal cortex extract did not produce as pronounced therapeutic effects in Paget's disease as did injections of the extract in solution. It is not suggested that Paget's disease

is a manifestation of adrenal insufficiency correctable by substitution therapy. Any attempt to explain the apparent salutary effect of adrenal glandular products on patients with Paget's disease would be pure speculation at the present time. That adrenal cortex extract may influence in some peculiar manner the underlying metabolic derangement in Paget's disease is suggested by the fact that a patient with cystic fibrous osteitis and an associated hyperphosphatasemia was treated with adrenal cortex extract without any reduction of the serum phosphatase or relief of pain. The fact that the synthetic cortical hormone, desoxycorticosterone acetate, did not seem to be as efficient in lowering the serum phosphatase or relieving the symptoms of patients with Paget's disease suggests that something in the cortical extract other than the hormone was responsible for the results. Williams has shown that adrenal cortex extract does not inactivate or inhibit bone phosphatase in vitro. Therefore it must be assumed that the therapeutic effects cannot be explained on the basis of inactivation or inhibition of the enzyme in the blood stream by the extract following its injection, but rather that a modifying influence is exerted on the tissue cells. Pending the acquisition of further scientific data the employment of adrenal glandular preparations in Paget's disease, although encouraging, must remain at best an empirical form of treatment.

Treatment of Hemangiomas with Solid Carbon Dioxide.—At the Hospital for Sick Children, 156 children with hemangiomas of various types were seen in the skin clinic during 1934 and 1935. In the spring of 1937 Wrong asked these patients to report for observation and seventy-eight did so. Of the seventy-eight patients fifteen had more than one lesion and the largest number of lesions treated with solid carbon dioxide on any one child was four. Of the ninety-six hemangiomas treated the results were excellent in thirty-seven, good in twenty-three, fair in sixteen and poor in twenty. Most of the good results were obtained in the tumors which were less than 1 cm. in diameter. When the tumor was between 1 and 2 cm. there were as many indifferent results as good ones. When the size reached more than 2 cm. the good results were few. A complicating factor to consider is that most of the larger lesions were also deep. The depth of the tumor is an important factor in determining whether a tumor will respond to freezing by solid carbon dioxide or not. The results in the thin lesions were nearly all excellent or good. In the thicker lesions this condition was somewhat reversed, and in the thick and pulpy lesions, i. e. those with subcutaneous involvement, there were no good results.

Endocrinology, Los Angeles

25:845-1042 (Dec.) 1939. Partial Index

- *Analysis of 583 Glucose Tolerance Tests. B. A. Watson, Minneapolis.—p. 845.
- *Response of Chronically Fatigued Neurotic Patients to Adrenal Cortex Therapy. J. H. Huddleson and R. A. McFarland, New York.—p. 853.
- Size of Spleen and Adrenals During Pregnancy and Puerperium. C. K. Sleeth and E. J. Van Lier, Morgantown, W. Va.—p. 867.
- Assay of Cortical Hormone. I. E. Uylert, Amsterdam, The Netherlands.—p. 871.
- Effect of Single Injection of Thyroxine on Carbohydrates, Protein and Growth in Rat Liver. R. Sternheimer, Chicago.—p. 899.
- Repression and Resorption of Corpora Lutea of Early Pregnancy Following Injections of Testosterone Propionate. H. O. Burdick and B. Emerson, Alfred, N. Y.—p. 913.
- *Histologic Changes in Senile Vagina Induced by Estrogenic Therapy Administered Orally and by Inunction. Rita S. Finkler and W. Antopol, Newark, N. J.—p. 925.
- Effect of Large Doses of Testosterone Propionate (Oreton) on Female Genital Tract of Very Young Rat: Production of Ovarian Cysts. H. Shay, J. Gershon-Cohen, K. E. Paschke and S. S. Fels, Philadelphia.—p. 933.
- Biologic Assay of Melanophore Hormone of Pituitary Gland. R. S. Teague, Chicago.—p. 962.
- Effects of Hypophysectomy on Blood Picture of Rat. E. P. Vollmer, A. S. Gordon, I. Levenstein and H. A. Charipper, New York.—p. 970.

Dextrose Tolerance Tests.—Among 51,096 routine urine examinations of students (average age 22.7 years) Watson found glycosuria to occur 583 times, or in 1.14 per cent of the cases. Of 33,125 urine examinations of male students glycosuria occurred 368 times, or in approximately 1.11 per cent, while among 17,971 such examinations of female students glycosuria was found 215 times, or in 1.19 per cent. In determining the incidence of glycosuria during tolerance test and its effect on mean blood sugars 186 of the 368 men and fifty-seven of the

215 women had glycosuria on one or more occasions during the test. Why almost twice as many men as women showed glycosuria is difficult to explain, as all subjects were given 100 Gm. of dextrose and the test was carried out under the same conditions in the two sexes. Of the 583 persons studied, ninety (15.4 per cent) had evidence of a definitely disturbed dextrose tolerance. Only forty-nine of the 583 subjects had a previous history of glycosuria and thirty-three of these forty-nine subjects had glycosuria sometime during the tolerance test. All blood sugar values of these subjects were slightly elevated except that of the fasting specimen. Some of these individuals might have had a mildly disturbed carbohydrate metabolism when glycosuria was first found, but because another urine specimen may have shown no sugar they were not treated at the time. Thus, during the elapsed time between the first and the second diagnosis of glycosuria one might expect a further loss of carbohydrate tolerance. A study of the relation of weight to the tolerance test revealed that the underweight (less than 90 per cent of normal) and normal weight subjects of both sexes had higher blood sugar values than the overweight (more than 10 per cent over normal weight) group. Of the 583 students with glycosuria, 67.7 per cent were of normal weight, 16.1 per cent were underweight and 16.1 per cent were overweight. This appears to be a normal weight distribution among the general college population. From the data obtained the author asserts that it is impossible to demonstrate that obesity by itself plays any part in the causation of a disturbed dextrose tolerance test. In fact, he believes that on a basis of his observations one would predict that underweight persons would be more likely candidates for disturbed carbohydrate metabolism than those who are overweight. Thus one may conclude that in this age group obesity plays no important part in the etiology of a disturbed carbohydrate metabolism. Among 109 students with a family history of diabetes the incidence of disturbed dextrose tolerance tests was 17.4 per cent as compared with 14.9 per cent among the remaining 474 students with glycosuria but with no family history of diabetes. Thus heredity cannot be considered an important etiologic factor in the production of a disturbed carbohydrate metabolism in this age group.

Fatigue of Neurotic Patients and Adrenal Cortex.—Huddleson and McFarland gave orally glycerinated adrenal cortex (pills) to fourteen patients suffering from psychoneuroses marked by asthenia. The experimental period for each patient was from ten to fifteen weeks. One week no medication was given, followed by two weeks of placebos. These three weeks, and occasionally later on placebos were given for a week, served as controls. The increasing doses of adrenal cortex pills ranged from fifteen to forty-eight pills daily, each pill representing 3 grains (0.2 Gm.) of fresh gland. Half the patients reported subjective improvement. Half gained a kilogram (2½ pounds) in weight. The basal metabolism weight was accelerated (improved) in eight. The Schneider index was bettered in nine and unaffected in five. The inventories of psychologic and of physiologic complaints showed improvement, respectively, in seven and six of the ten patients so tested. The word association test indicated fewer neurotic responses in seven, neuromuscular coordination was improved in five and perseveration was lessened in four. Following the medication, objective tests showed improvement of more than half of the patients. Seemingly this treatment has proved valuable in obstinate asthenic psychoneurosis.

Changes Induced in Senile Vagina by Estrogen.—According to Finkler and Antopol, of thirty-seven patients presenting symptoms of senile vulvovaginitis twenty-one were treated by local application of estrogenic ointment and sixteen were given estrogenic substances orally. Topical application, especially to patients who had only slight or no general menopausal symptoms, alleviated the symptoms of senile vulvovaginitis and produced pronounced histologic changes in the vagina. Patients presenting inflammatory changes superimposed on an atrophic vaginal mucosa responded rapidly to local treatment. Evidence that systemic absorption takes place in the course of inunction was manifested by slight to moderate improvement in the vasomotor symptoms of the menopause and a recurrence of uterine bleeding in one case. Oral administration of estrogens also proved of value. The results were similarly beneficial. This

form of therapy is indicated in patients presenting marked vasomotor disturbances in addition to the symptoms of senile vulvovaginitis. In many instances oral medication was substituted for intramuscular medication, because of the reappearance of uterine bleeding after injection treatment. Uterine bleeding, however, occurred in the two patients treated orally with diethylstilbestrol. This would seem to indicate unusual oral activity of the substance. Such bleeding did not occur in patients receiving two other estrogenic preparations. Of the twenty-one patients treated by inunction, six obtained partial relief and fifteen showed marked improvement. Of the sixteen patients treated orally, only one failed to respond. Better cooperation on the part of the patient was obtained when the treatment was given orally.

Florida Medical Association Journal, Jacksonville

26: 265-316 (Dec.) 1939

- Evaluation of More Common Serodiagnostic Tests of Syphilis. J. N. Patterson, Jacksonville.—p. 275.
Value of Tuberculin Test. P. P. McCain, Sanatorium, N. C.—p. 279.
Differential Diagnosis in Tuberculosis Work. N. M. Marr, St. Petersburg.—p. 281.
Primary Tuberculosis in Adults. N. O. Pearce, Miami Beach.—p. 283.
Therapeutic Pneumothorax: Its Technic, Indications and Value. W. O. Fowler, Orlando.—p. 285.
Will X-Rays Replace the Clinician in Diagnosis of Early Tuberculosis? C. M. Gray, Tampa.—p. 287.
Meckel's Diverticulum: Report of Case with Simple Inversion Causing Partial Obstruction of Ileum. L. W. Martin, Sebring.—p. 290.

Illinois Medical Journal, Chicago

76: 489-576 (Dec.) 1939

- Use of Progestin in Obstetric Complications. F. H. Falls, Chicago.—p. 507.
Obstruction of Common Bile Duct by Stones. W. H. Cole, Chicago.—p. 512.
Influence of Health Education on Practice of Medicine. W. W. Bauer, Chicago.—p. 519.
Rheumatic Fever in Children: Etiology. G. L. Drennan, Jacksonville.—p. 524.
Signs and Symptoms of Rheumatic Fever. K. Woodward, Rockford.—p. 526.
Treatment of Rheumatic Fever in Children. H. W. Elghammer, Chicago.—p. 527.
Pathology of Rheumatic Fever. S. Gibson, Chicago.—p. 530.
Stuttering as Emotional and Personality Disorder. M. Solomon, Chicago.—p. 536.
Etiology and Differential Diagnosis of Gastric Hemorrhage. M. M. Montgomery, Chicago.—p. 542.
Mastoidectomy: Review of Mastoid Operations: Report of Case with Remarks on Selection of Procedure. G. H. Woodruff, Joliet.—p. 547.
A. J. Mauzey, Chicago.—p. 549.
Loar, Bloomington.—p. 551.
Two Years' Experience with Audiometer in the Springfield, Ill., Schools. G. Koehler, Springfield.—p. 555.
Intractable Peptic Ulcer. C. H. Drenckhahn, Urbana.—p. 557.
Tuberculosis in Children, Considering Contact in Domestic Servant. E. T. McEnery, Chicago.—p. 559.
Psychoses with Pernicious Anemia. G. A. Wiltrakis and A. V. Partipilo, Chicago.—p. 562.
Cancer of Cervix. M. S. Underhill, Evanston.—p. 566.
Review of Metrazol Treatments. M. Isenbergs, East Moline.—p. 568.

Stuttering as Emotional and Personality Disorder.

Solomon believes that stuttering is a specifically conditioned personality, emotive behavior and speech disorder in the struggle for equilibrium during social converse. It is a type of adjustive behavior. As stuttering is an overactive response of the total personality, there are responses at all levels of activity, depending on the stage of maturation of the individual. The objective phenomena are present in varying degree and quality in the first and recurrent moments of stuttering. They include: (1) activities in the peripheral speech machinery; disruption of coordination of the oral, laryngeal and respiratory systems, with terminal speech block, either clonic and incomplete as in hesitation and repetition or tonic and complete as in failure to produce any sound, (2) skeletal manifestations, with postural, gestural reactions from head to toes, (3) visceral and autonomic responses, from tachycardia to secretory and excretory changes and (4) physiochemical upheaval, peripheral and central, including electroencephalographic manifestations. The subjective, so-called mental, phenomena occur in the first moment of stuttering, when there seems to be mainly a state of excitement (which may be preceded or followed by other emotions). With recurrent moments the final product is very complex. Generalized expectancy occurs whenever the stutterer confronts a conditioned social speech situation and is often accompanied by a search for speech difficulty and a rehearsal of planned verbal expression. Specific expectancy occurs when he attempts a specific

word. This gives rise to various expectant devices, such as avoidance, giving up the speech attempt, substituting a different word; postponement, pausing, repeating preceding words; initiation or using "starter" words; antiexpectancy and disguise, a monotone, singsong speech, and preparatory set for release reaction. Stuttering is a clinical syndrome. Careful consideration of all internal and external factors responsible for its onset and continuation is essential (physical condition, the routine daily program and habits, the personality makeup and problems, the living conditions and personalities in the home, neighborhood, school and workshop). Treatment should include the total personality and not only the speech phenomena. It should be a combination of physical and mental hygiene, physical therapy, psychotherapy and environmental therapy adapted to the particular patient, with the goal of readjustment. Especially valuable is intensive personality study and reorganization leading to better peace of mind and social adjustment. Stuttering can be properly understood only by the application of basic scientific principles.

Psychoses with Pernicious Anemia.—From 1931 to 1938, Wiltrakis and Partipilo encountered twenty-four cases of pernicious anemia among the 13,023 mental patients admitted to the Elgin State Hospital. The diagnosis of nine, in addition to the anemia, was psychosis, of seven paranoid symptom complexes, three were classified psychosis with cerebral arteriosclerosis and the others had various mental diagnoses. The pernicious anemia was considered the primary cause of the psychosis of sixteen of the twenty-four cases. In twelve the anemia was observed prior to the onset of mental symptoms and in the remaining four within a maximal period of one year after the onset of psychosis. The psychosis of pernicious anemia is not characterized by any specific form of mental behavior, yet certain mental symptoms predominate. A marked irritability is frequently present and paranoid states, confused states and depressions are observed often. Undoubtedly the prepsychotic personality is of considerable importance in the reaction pattern. Prominent among these symptoms are marked irritability and uncooperativeness. The adjectives frequently used in literature in describing the behavior of these patients are irritable, stubborn, peevish, surly, obstinate, disagreeable, faultfinding, cantankerous and refractory. A pronounced symptom of nine of the sixteen patients was irritability. Prognosis in this psychosis is poor, yet mental recoveries do occur and the patients should be given the benefit of prolonged and extensive antianemia therapy.

Iowa State Medical Society Journal, Des Moines

29: 589-640 (Dec.) 1939

- Blood Sedimentation Test. F. H. Lamb, Davenport.—p. 589.
Use of Vitallium for Fixation of Fractures. W. C. Campbell, Memphis, Tenn.—p. 591.
Insomnia. J. S. McQuiston, Cedar Rapids.—p. 595.
Silk and Surgical Wound. M. J. Brown, Davenport.—p. 600.
Neurosis and Digestive Disorders. H. C. Bone, Des Moines.—p. 603.
Serum Treatment of Pneumonia. R. N. Larimer, Sioux City.—p. 607.
Some Recent Developments in Plastic Surgery. L. H. LaDage, Davenport.—p. 609.

Vitallium for Fixation of Fractures.—Because of the many disastrous results observed, Campbell formerly avoided the use of metal plates for the fixation of fractures, but after the introduction of vitallium he began to use it for selected cases. Since February 1937 he has employed this material in 108 cases. Roentgenograms made over a period of several months have shown no evidence of absorption of the bone about the screws or of inflammatory changes in the soft tissues. Callus appears to have covered the plate partially in many of the cases. Eight plates have been removed at periods varying from four to ten months after operation. In every case the screws were firmly embedded in the bone, necessitating removal with a screw driver. There was no evidence of corrosion or tarnishing of the metal, nor was the soft tissue about the plates stained; rather, it appeared to be normal scar and fibrous tissue such as is found in the healing of any surgical wound. Accurate alignment of the fragments was maintained in all fractures with the exception of one. A review of a large number of fractures from which wires, pins and screws of ferrous materials, Parham bands and steel plates of the Lane type were removed shows that ferrous materials often induce an unfavorable tissue reaction about the fracture site; yet obviously inefficient mechanical fixation is a

definite factor in producing complications requiring removal of the material. Laxity in the practice of strict asepsis also contributes to a not inconsiderable number of disastrous results following open reduction and internal fixation. Exposure converts a simple fracture into a compound fracture, with many of its risks. However, with proper observance of asepsis and accurate fixation by vitallium the dangers of open reduction and internal fixation are minimized and are outweighed by the advantages of replacement and maintenance of the fragments in anatomic position.

Johns Hopkins Hospital Bulletin, Baltimore

65: 431-508 (Dec.) 1933

- Electrocardiographic Changes in Acute Hemorrhagic Nephritis. R. D. Williams, Baltimore.—p. 434.
Cyanosis in Chickens and Mice Induced by Sulfanilamide. A. P. Richardson, Baltimore.—p. 445.
Coincidence of Diabetes Mellitus and Addison's Disease: Effect of Cortical Extract on Glycemia and Glycosuria. A. L. Bloomfield, San Francisco.—p. 456.
*Further Studies on Effect of Sulfanilamide on Experimental Tuberculosis. R. H. Follis Jr. and A. R. Rich, Baltimore.—p. 466.
Nerve Endings in Cardiac Muscle of Rat. A. B. King, Baltimore.—p. 489.

Sulfanilamide and Experimental Tuberculosis.—Follis and Rich observed the effect of sulfanilamide on experimental tuberculosis in the rabbit, and the results confirm their previous study on the guinea pig which demonstrated that adequate doses of the drug, properly administered, have a definite inhibitory effect on the development of the disease. Individual rabbits exhibit marked differences in the degree to which they acetylate the drug and in their ability to attain and maintain a high concentration of the drug in the blood following the administration of a given dose. These differences undoubtedly play a part in determining the degree to which a given dose of the drug will exert a beneficial effect on the progress of the tuberculosis in different animals. No conclusions regarding the effect of sulfanilamide on human tuberculosis should be drawn from the experiments, as that requires a separate and carefully controlled study.

Journal of Experimental Medicine, New York

70: 543-660 (Dec.) 1933

- Quantitative Studies of Prostatic Secretion: I. Characteristics of Normal Secretion; Influence of Thyroid, Suprarenal and Testis Extirpation and Androgen Substitution of Prostatic Output. C. Huggins, M. H. Masina, Lillian Eichelberger and J. D. Wharton, Chicago.—p. 543.
Further Studies on Blood and Hematopoietic Tissues in Malignant Pancytopenia of Cats. W. D. Hammon and J. F. Enders, Boston.—p. 557.
Experimental Studies on Virus of Infectious Avian Encephalomyelitis. P. K. Olitsky, New York.—p. 565.
Masking Effect of Extravasated Antibody on Rabbit Papilloma Virus (Shope). J. G. Kidd, New York.—p. 583.
Blood Plasma Proteins as Influenced by Intravenous Injection of Gum Acacia: II. Production of Chronic Hypoproteinemia. C. L. Yuile and R. E. Knutti, Rochester, N. Y.—p. 605.
Effect of Dietary Protein on Course of Nephrotic Nephritis in Rats. L. E. Farr and J. E. Smadel, New York.—p. 615.
*Prolonged Maintenance of Spirochetes and Filtrable Viruses in Frozen State. T. B. Turner and W. L. Fleming, Baltimore.—p. 629.
*Factors Influencing Survival of Spirochetes in Frozen State. T. B. Turner and Nancy L. Brayton, Baltimore.—p. 639.

Virulence of Spirochetes and Filtrable Viruses in Frozen State.—Turner and Fleming tested the virulence of five specimens of *Spirochaeta pallida* belonging to four different strains and seven specimens of *Treponema pertenue* belonging to five different strains after storage for approximately three years at a temperature of -78°C . With one exception each specimen contained actively motile spirochetes and all specimens were highly pathogenic for rabbits. Many other specimens of these spirochetes stored for shorter periods were also tested with similar results. Relapsing fever spirochetes tested after storage for from six months to one year showed active motility and were virulent for mice. *Leptospira icterohaemorrhagiae* was found to be actively motile after storage for five, six and ten months. The spirochete of rat bite fever, *Spirillum minus*, was virulent for mice after storage for one year. The virus of human influenza, PR8 strain, tested after storage for approximately three years was fatal to mice in essentially the same dilution as was the same lot of material before freezing. Similar results were obtained on testing the virus of meningopneumonitis after storage for three years. The virus of venereal lymphogranuloma was pathogenic for mice after storage for ten months.

Factors Influencing Survival of Frozen Spirochetes.—From a study of factors which influence the survival of spirochetes in the frozen state, Turner and Brayton conclude that the optimal conditions for the preservation of spirochetes, and probably other micro-organisms, in the frozen state are afforded by rapid cooling, storage at -78°C . and rapid thawing. These organisms are severely damaged by storage at temperatures of -20°C . or higher and by slow thawing.

Journal of Infectious Diseases, Chicago

65: 225-326 (Nov.-Dec.) 1933. Partial Index

- *Value of Complement Fixation Test in Diagnosis of Psittacosis. K. F. Meyer and B. Eddie, San Francisco.—p. 225.
*Psittacosis in Importations of Psittacine Birds from the South American and Australian Continent. K. F. Meyer and B. Eddie, San Francisco.—p. 234.
Preservation of St. Louis Encephalitis Virus. E. H. Lennette and Margaret G. Smith, St. Louis.—p. 252.
Studies on Lactobacilli: II. Type-Specific Immunologic Reactions of Oral Strains. R. W. Harrison, Zdenka C. Zidek and Elizabeth S. Hemmens, Chicago.—p. 255.
Endocarditis Caused by *Salmonella* Suissetifer. C. T. Read, Cincinnati.—p. 263.
Therapeutic Properties of Sulfanilamide in Experimental Pneumococcal Infections. L. H. Schmidt and Carolyn Hilles, Cincinnati.—p. 273.
Effects of Neosarsphenamine and Sulfarsphenamine on Experimental Fusospirochetal Infection in Guinea Pigs. T. Rosebury, Genetiv Foley and F. L. Rights, New York.—p. 291.
Estimation of Purified Papilloma Virus Protein by Infectivity Measurements. W. R. Bryan and J. W. Beard, Durham, N. C.—p. 306.
Erysipeloid: Occurrence Among Veterinary Students. C. C. Morrill, Manhattan, Kan.—p. 322.

Complement Fixation Test in Psittacosis.—Meyer and Eddie discuss three importations of psittacine birds. Preliminary studies indicate that with the complement fixation test it may be possible to separate infected or recovered birds from healthy ones. Two of six serums collected from laboratory workers and bird inspectors gave repeatedly specific fixation reactions in dilutions of 1:8 to 1:16. These two workers, who have been intimately exposed to virus, have never had any illness suggestive of psittacosis except the usual colds. Subclinical silent infections have always been suspected. A man and wife permitted a sick bird to pick seeds from their lips. His blood serum gave a gradually increasing specific complement fixation reaction in the presence of psittacosis antigens (1:32). Her blood serum reacted in a dilution of 1:8 and rose within twenty days to 1:16. The exposure probably led in the man to a clinical and in the wife to a subclinical infection. A laboratory worker who contracted psittacosis and was desperately ill on the sixteenth day was given, both intravenously and intramuscularly, 125 cc. of convalescent serum with a neutralization index of less than 4.0. Within twenty-four hours his temperature dropped. The extensive pneumonic process began to clear four days after the administration of the serum. If any benefit is to be expected, it is important to use serum high in neutralizing antibodies. Hyperimmune serum prepared on goats is now available from the Hooper Foundation. The authors' conclusions are that: The complement fixation tests with cocto-antigen prepared from virulent mouse spleens or preferably Rivers-Li tissue cultures of the virus are invaluable aids in the early and late diagnosis of human psittacosis. Convalescent serum may shorten the course of the disease and should be tried. Highly potent goat serum may be equally effective.

Journal of Investigative Dermatology, Baltimore

2: 301-389 (Dec.) 1933

- *Histaminase in Treatment of Urticaria and Atopic Dermatitis: Preliminary Report. C. W. Laymon and H. Cumming, Minneapolis.—p. 301.
Mitotic Index of Palmar and Plantar Epidermis in Response to Stimulation. J. M. Thuringer, Oklahoma City.—p. 313.
*Infectivity of Saliva in Early Syphilis. C. W. Barnett and G. V. Kulehar, San Francisco.—p. 327.
Blood Plasma Bromide Levels in Bromoderma. L. W. Kimbly, Lexington, Ky.—p. 331.
Pathology of Lupus Erythematosus. H. Montgomery, Rochester, Minn.—p. 343.
Nails and Nail Changes: I. Investigation of Nail Lacquers and Their Components. H. Silver and B. Chiego, New York.—p. 361.

Histaminase for Urticaria.—Laymon and Cumming used histaminase in treating seventeen cases of urticaria, two of urticaria factitia and eight of atopic dermatitis. These cases had proved refractory to all other types of treatment. In the cases in which histaminase was administered, no other treatment was given. In most instances histaminase was given by intramuscular

cular injections from one to three times a week as well as two or three tablets three times a day by mouth. There were no unfavorable reactions to the drug. Ten cases of urticaria were clinically cured. The duration of treatment varied from four days to three weeks. The average time for cure was 10.7 days. Two patients improved. One patient had urticaria for nine months and was 50 per cent improved after three weeks of treatment. Another patient had urticaria for several years and was 90 per cent improved after two months of treatment. The duration of the urticaria in the five cases in which improvement did not occur was from several weeks to three and a half years. There was no improvement in the two cases of autographism. No definite improvement was experienced in any of the cases of atopic dermatitis, although one month's trial of histaminase was given. From the results in their few cases the authors feel that histaminase is a useful adjunct to other therapeutic measures in urticaria. The nature of whatever antiallergic properties histaminase possesses are as yet not known. It may be that histamine is inactivated.

Infectivity of Saliva in Early Syphilis.—Saliva obtained directly from the parotid duct of seven patients with florid secondary syphilis was inoculated by Barnett and Kulchar into rabbits. The results were negative. The infectivity of saliva in patients with syphilis probably is due to contamination from intra-oral syphilitic lesions.

Journal of Urology, Baltimore

42: 917-1312 (Dec.) 1939

- Incidence of Urinary Tract Obstruction in Renal Calculus Formation. J. C. Birdsall, Philadelphia.—p. 917.
Treatment for Unilateral and Bilateral, Staghorn Renal Calculi. J. T. Priestley, Rochester, Minn.—p. 933.
Resection of Rib in Renal Operations. E. Hess, Erie, Pa.—p. 943.
Hypertension's Challenge to Urology. S. W. Mulholland, Philadelphia.—p. 957.
Pyelonephritis in Children and Adults with Hypertension. A. E. Bothe, Philadelphia.—p. 969.
Nature of Renal Injury in Acute and Chronic Colon Bacillus Pyelonephritis in Relation to Hypertension: Combined Clinical and Pathologic Study. E. G. Crabtree and E. L. Prien, Boston.—p. 982.
Management of Ureter in Tuberculous Lesions of Kidney. T. L. Howard, Denver.—p. 1003.
Experimental Examination of Factors Causing Ureteral Dilatation of Pregnancy. G. van Wageningen and R. H. Jenkins, New Haven, Conn.—p. 1010.
Ureterovaginal Fistula: New Method of Reimplantation of Ureter into Bladder. J. F. Patton, St. Louis.—p. 1021.
Müllerian Duct Cysts: Report of Case. R. A. Hennessey, Memphis, Tenn.—p. 1042.
Renal Ectopia: Special Reference to Crossed Ectopia Without Fusion. A. Harris, Brooklyn.—p. 1051.
Plastic Surgery of Renal Pelvis. R. B. McIver, Jacksonville, Fla.—p. 1069.
Transurethral Resection in Treatment of Carcinoma of Prostate. W. N. Wishard Jr., H. G. Hamer and H. O. Mertz, Indianapolis.—p. 1088.
*Comparison of Results in Treatment of Prostatic Obstruction by Transurethral Resection and Prostatectomy. B. S. Abeshouse, Baltimore.—p. 1101.
Sexes and Hermaphroditism. J. F. McCahey, Philadelphia.—p. 1130.

Prostatic Obstruction.—A review of the results of 200 consecutive transurethral resections and 234 prostatectomies, Abeshouse states, shows that transurethral resection is the preferred operation for cases of median bar, solitary median lobe and solitary subcervical hypertrophies. It affords palliative relief for persistent suprapubic fistulas and for cases of carcinoma with obstructive symptoms and provides an excellent method of removing obstruction caused by contractions, nodules or tags following prostatectomy. The operation is not suitable in cases in which there are large bilobe or trilobe hypertrophies with marked intravesical or intra-urethral bulging. He finds that suprapubic prostatectomy is suitable for cases with marked enlargement of the prostate, especially for those accompanied by conditions of the bladder requiring operative treatment. Perineal prostatectomy is an ideal operation for treating large hypertrophies and small fibrotic glands with or without prostatic calculi. It is the only method offering a cure for early or concealed carcinoma. It requires greater operative skill and, when properly done, gives an equally good functional result. Mastery of the operative technic will dispel the fear of incontinence, impotence and fecal fistula. The most important lesson derived by the author from this study is that every patient with prostatic obstruction, irrespective of age, risk or type of obstruction, can be offered a reasonable hope of relief or even cure by the judicious selection of the proper type of operative procedure.

Kansas Medical Society Journal, Topeka

40: 449-492 (Nov.) 1939

- Serum Treatment of Pneumonia. C. D. Head Jr., Washington, D. C.—p. 449.
Various Manifestations of Cerebral Arteriosclerosis. R. R. Grinker, Chicago.—p. 453.
Treatment of Carcinoma of Colon and Rectum. G. B. Kent and K. C. Sawyer, Denver.—p. 458.
*Acute Leukemia and Erythremia. M. Gerundo, Topeka.—p. 460.
Pentothal Sodium in Major Orthopedic Surgery. J. D. Bowen, Topeka.—p. 462.
Note on Subconvulsive Metrazol Therapy. E. Eisner, Osawatomic.—p. 463.
40: 493-536 (Dec.) 1939
Acute Hematogenous Osteomyelitis. P. C. Colonna, Oklahoma City.—p. 493.
Chronic Brucellosis as Major Cause of Neurasthenia. W. S. Horn, Fort Worth, Texas.—p. 498.
Urinary Tract Infections and Their Management. A. L. Stockwell, Kansas City, Mo.—p. 505.
Use of Barbiturates in Surgery: III. M. A. Walker, L. G. Allen, G. B. Ladd, Kansas City, and L. B. Mellott, Bonner Springs.—p. 511.
Pneumonia in Childhood. D. R. Davis, Emporia.—p. 512.
Psychosis Following Use of Marijuana: Report of Cases. H. C. Curtis, Wichita.—p. 515.

Acute Leukemia and Erythremia.—The virus theory of the leukemias, according to Gerundo, should receive more attention. There are enough observations to establish the hypothesis on solid ground. From a comparative study between tumors and leukemia it is evident that leukemias are not tumors nor similar to tumors in any way, since they are systemic diseases of tissue present in every part of the body. The atypical cells of cancer are never found in leukemia. The fact that cells show mitoses does not prove their malignant condition, since mitoses are always present in normal bone marrow. The mitoses are never atypical in leukemia, while they are almost always atypical in cancer. The leukemic infiltrations are not present where there is no potential hemopoietic tissue, as in the brain, and leukemic growths have not been found inside the nervous tissue. The author agrees with the conception of Ferrata and many other hematologists of a hyperplastic process of the hemopoietic organs. Such hyperplasia may be brought about by the action of a virus. A new conception is advanced to explain the phenomenon of leukopenia. The normal functional inhibition of the spleen on the growth and expulsion of the cells from the bone marrow and hemohistioblastic nests may be increased, producing a leukopenic state, and may suffer oscillations in capacity or rate, offering periods of complete aleukemia alternating with periods of marked leukocytosis.

Kentucky Medical Journal, Bowling Green

37: 559-600 (Dec.) 1939

- Gallbladder and Biliary Passages. J. G. Sherrill, Louisville.—p. 560.
Preoperative and Postoperative Care in Diseases of Gallbladder and Gallducts. A. M. McKeithen, Louisville.—p. 565.
Some Practical Aspects of Children's Problems. W. K. Keller, Louisville.—p. 571.
Some Practical Thoughts About "Sinus Trouble." C. L. Woodbridge, Middlesboro.—p. 575.
Lead Poisoning in Infants and Children. J. J. Glaboff, Louisville.—p. 577.
Pathogenesis of Anemia: Anemia as Problem for the Neuropsychiatrist. H. Gordon, Louisville.—p. 580.
Prevention of Toxemia in Pregnancy. E. G. Heiselman, Newport.—p. 583.
*Intracranial Complications in 250 Cases of Surgical Mastoid Infections. A. L. Juers, Louisville.—p. 585.

Intracranial Complications of Surgical Mastoid Infections.—In 250 cases of surgical mastoiditis Juers encountered seventeen instances of intracranial complications (eight of petrositis, two of labyrinthitis, one of meningitis and six cerebral abscesses). He observed that the development in not a few of the intracranial complications could have been prevented if the patient had sought and been given earlier treatment for a potentially dangerous otic infection. As these cases were all seen before the era of sulfanilamide and its derivatives their management would at present be somewhat different, and more conservative surgical procedures could probably have been carried out in some of them. However, delay in the adequate surgical treatment of long-standing suppurative otitis media is still responsible for a large number of intracranial complications. While this is only too well known to otologists, some physicians and most laymen still regard a painless draining ear as a condition of no consequence. In addition to complete exenteration of all accessible mastoid cell structure, wide uncovering or decompression of the dura over a suspected intradural lesion rules out the presence of any extradural

pathologic change or it discloses a lead of infection through the dura or it allows room for swelling incidental to inflammation of the brain tissue, whether it is a localized meningitis or encephalitis or an abortive or a cerebral abscess. In the latter instance the decompression may enable the patient to survive until it is felt that the abscess is sufficiently walled off to permit surgical drainage through a clean area later. When relief of increased intracranial pressure is urgent, ventricular puncture should be considered. In the presence of an abscess, however, its use is attended by some danger. The author believes that intracranial complications would not have developed in five of the six fatal instances if earlier adequate surgical treatment had been given.

Missouri State Medical Assn. Journal, St. Louis

36: 471-514 (Dec.) 1939

- Modern Trends in Pneumonia Therapy. R. O. Muether, St. Louis.—p. 471.
Surgical Aspects of Peptic Ulcer. W. H. Cole, Chicago.—p. 474.
Internal Fixation of Fractures of Neck of Femur. O. P. Hampton and J. E. Stewart, St. Louis.—p. 478.
Barbituric Acid Dermatitis with Photosensitization. G. V. Stryker, St. Louis.—p. 484.
Barbiturates Should Be Sold Only on Prescription. L. D. Cady, St. Louis.—p. 485.
Use of Barbiturates in Mental Hospitals. F. M. Grogan, St. Louis.—p. 487.
Side Effects of Barbiturate Sedation: Their Clinical Importance. P. Shelton, Kansas City.—p. 488.
Observations on Addiction to Barbituric Acid Derivatives. G. W. Robinson Jr., Kansas City.—p. 490.
*Barbituric Acid and Mental Health. G. W. Robinson Sr., Kansas City.—p. 493.
Some Undesirable Effects of Barbituric Acid and Its Derivatives. D. P. Johnson and I. L. Howell, St. Joseph.—p. 494.

37: 1-40 (Jan.) 1940

- Present Day Trends in Treatment of Schizophrenia. W. Malamud and J. S. Gottlieb, Iowa City.—p. 1.
1937 St. Louis Epidemic of Encephalitis: Follow-Up Studies. A. B. Jones and G. S. Bozalis, St. Louis.—p. 5.
Traumatic Constrictive Pericarditis. E. E. Glenn, Springfield.—p. 7.
Modern Treatment of Pneumonia, with Discussion of Atypical Types. O. P. J. Falk, St. Louis.—p. 11.
The Crippled Child in Missouri. A. O'Reilly, St. Louis.—p. 14.
Prevention of Deformity in Childhood. C. H. Crego Jr., St. Louis.—p. 18.
Infantile Paralysis. W. J. Stewart, Columbia.—p. 20.
Cerebral Spastic Paralysis. F. D. Dickson, Kansas City.—p. 20.
Tuberculosis of Bones and Joints. J. A. Key, St. Louis.—p. 22.
Progenetic Osteomyelitis. J. Kulowski, St. Joseph.—p. 24.
Deformity Following Accidental Injuries. R. M. Schaufliker, Kansas City.—p. 25.

Barbituric Acid and Mental Health.—Robinson states that barbituric acid compounds do not promote but delay recovery from mental ill health. They further impair an already impaired brain nutrition. Sugar is the chief food of the brain for its activity. At the Neurological Hospital, where tolerance tests are done as a routine, in practically 100 per cent of all cases of psychoses, neuroses and alcoholic and narcotic addiction there is found an abnormally low ability to metabolize sugar. He suggests that insulin may be the answer, as it promotes sugar metabolism and if wisely administered, is an excellent sedative and hypnotic, and when given with dextrose it corrects states of disordered brain nutrition and disordered brain function. In the treatment of mental ill health barbituric acid compounds have a place, but only to meet emergencies and to relieve the patient temporarily of insomnia and mental distress.

New England Journal of Medicine, Boston

221: 959-1002 (Dec. 21) 1939

- Medical Problems of the Day. R. Sleyter, Wauwatosa, Wis.—p. 959.
Further Experiences with Potassium Sulfoeyanate Therapy in Hypertension. R. W. Robinson and J. P. O'Hare, Boston.—p. 964.
Biliary Surgery in the Aged: Study of 100 Consecutive Cases. T. B. Quigley, Boston.—p. 970.
*Treatment of Hypoproteinememia with Synthetic Vitamin K₁: Report of Two Cases. H. A. Frank, A. Hurwitz and A. M. Seligman, Boston.—p. 975.
Surgical Treatment of Thyroid Disease. F. H. Labey, Boston.—p. 978.

Synthetic Vitamin K₁ in Hypoproteinememia.—Frank and his collaborators used synthetic vitamin K₁ (2-methyl-3-phytyl-1,4-naphthoquinone) for the first time in two cases of obstructive jaundice. Before reporting the histories of these cases they say that no ill effect was observed in white mice, which were fed 10 mg. doses of the synthetic vitamin, nor in three human subjects each of whom was given 20 mg., together with bile, by mouth. For intravenous use the synthetic vitamin, which is an oil at room temperature, was given as a

freshly prepared colloidal suspension in 10 per cent dextrose. This solution was prepared by dissolving 10 mg. of the oil in 2 or 3 cc. of absolute alcohol; this was boiled in order to sterilize the quinone and was slowly introduced, by means of a pipet, below the surface of a well agitated sterile solution of 1,000 cc. of 10 per cent dextrose in distilled water. The final solution was slightly opalescent. No particulate matter could be seen microscopically nor was there any tendency for the quinone to separate as an oil, even after standing for several days. The case histories are accompanied by charts recording the responses in terms of drops in prothrombin clotting time following oral and intravenous administration of synthetic vitamin K₁. In the first case a single dose of 10 mg. of synthetic vitamin K₁ given by mouth with bile on two occasions to a patient with an elevated prothrombin clotting time produced a drop which was maximal at the end of twenty-four hours. The time rose again in the next twenty-four hour period. The intravenous administration of the same dose resulted in a fall to normal levels within four hours. Twenty-four hours after injection, 10 mg. of the vitamin with bile was again given by mouth to prepare the patient for operation on the following day. At no time during the operation or in the postoperative period was abnormal bleeding noted. The prothrombin time remained within normal range, without further administration of the vitamin, until death on the third postoperative day. The results obtained in this case suggest that oral doses repeated at twelve hour intervals might have maintained the prothrombin level within normal limits. In case 2 a single intravenous dose of 10 mg. of synthetic vitamin K₁ resulted in a fall in prothrombin clotting time to a normal level within four hours. The clotting time remained within a normal range for six days after injection, despite the fact that an operation was performed during this period.

New Jersey Medical Society Journal, Trenton

36: 695-758 (Dec.) 1939

- Tribute to Dr. Edward J. Ill, "First President, Benefactor and Trustee of the Academy of Medicine of Northern New Jersey," on Establishment of "The Edward J. Ill Award". W. P. Eagleton, Newark.—p. 699.
Why Cancer Should Be of Interest to the General Practitioner. W. G. Herrman, Asbury Park.—p. 705.
Fetal Respiration and Its Relation to Asphyxia, Atelectasis and Pneumonia of Newborn. F. F. Snyder, Chicago.—p. 711.
Differentiation of Tuberculous and Nontuberculous Pulmonary Infections. A. E. Jaffin, Jersey City.—p. 714.
The Doctor Shares a Responsibility in Adoptions: Adoption of Children: Article Number Two. Ellen C. Potter, Trenton.—p. 718.
Technic of Gastroscopy and Indications for Its Use. A. J. V. Klein, Newark.—p. 720.

New Orleans Medical and Surgical Journal

92: 289-348 (Dec.) 1939

- Convalescent Serum in Prevention and Treatment of Common Contagious Diseases in Childhood. R. T. Lucas, Shreveport, La.—p. 289.
Radiology versus Pseudoradiology. S. Hachette, Lake Charles, La.—p. 295.
Roentgenologic Diagnosis of Certain Appendicular Conditions. A. Mayoral, New Orleans.—p. 300.
Danger of Eccholics: Report of Case of Cinchonism. H. J. Dauterive and O. E. Dalton, New Iberia, La.—p. 302.
Hysterosalpingography: Valuable Adjunct in Gynecologic Diagnosis. T. B. Sellers, J. T. Sanders and J. J. Young, New Orleans.—p. 304.
Acute Lymphocytic Choriomeningitis: Report of Twelve Cases from Louisiana. C. J. Tripoli and D. E. Fader, New Orleans.—p. 308.
Symptoms, Diagnosis and Treatment of Pellagra, with Special Reference to Use of Nicotinic Acid. J. P. Davis, Lake Providence, La.—p. 315.
Public Health Aspects of Syphilitic Patient. A. L. Adam, Shreveport, La.—p. 322.

New York State Journal of Medicine, New York

39: 2235-2310 (Dec. 15) 1939

- Prostatic Obstruction: Medical and Surgical Aspects. H. H. Young, Baltimore.—p. 2241.
Periarteritis Nodosa: Report of Three Cases Diagnosed Clinically and Confirmed by Necropsy in Two Instances and by Biopsy in Third Case. E. Appelbaum and M. Kalkstein, New York.—p. 2253.
Malignant Tumors in Children. E. Kellert, Schenectady.—p. 2259.
*Extrarectal Metastatic Malignancy Simulating Primary Carcinoma of Rectum. H. E. Bacon, Philadelphia.—p. 2267.
Diabetic Experiments. F. M. Allen, New York.—p. 2274.
New York State Program for Cancer Control. E. S. Goltfey Jr., Albany.—p. 2280.

Extrarectal Malignant Metastasis Simulating Primary Carcinoma.—Bacon reports twenty-two proved cases of upper abdominal and mammary malignant neoplasms with metastasis to the pelvic peritoneal pouch. Of these, fifteen occurred in

men and seven in women; the average age was 54.5 years. Whereas the condition was advanced in all the cases in the series, it must be realized that such metastasis may occur early and be the only site of invasion. The condition is of importance in that it is not extremely rare and the symptoms may not direct attention to the primary site, because the extrarectal process may be incorrectly diagnosed and a radical extirpation performed. The primary growths were found most frequently in the stomach. Twenty-one of the tumors were adenocarcinomas and one was a sarcoma. Although misinterpreted in many instances, the rectal growths were palpated. This can be attributed to the fact that the more recent graduates have learned that no physical examination is ever complete without a thorough digital and proctosigmoidoscopic examination.

Northwest Medicine, Seattle

38: 455-492 (Dec.) 1939

- Approval of Laboratories. W. Levin, Portland, Ore.—p. 458.
Perineal Pruritus an Allergic Manifestation? B. R. Brooke, Portland, Ore.—p. 462.
Pneumonectomy: Case Report. A. H. Winkel and E. A. Rogge, Seattle.—p. 465.
Simple Methods for Studying Skin Factors in Liver Extract: Clinical Observations on Cases of Acne Vulgaris. W. Marshall, Appleton, Wis.—p. 467.
Opacities of Cornea and Their Treatment. F. A. Kiehle, Portland, Ore.—p. 469.
Acute Otitis Media in the Newborn: Report of Four Cases. L. A. Parsell, Spokane, Wash.—p. 471.
Inversion of Uterus: Report of Case. R. M. McKeown, Marshfield, Ore.—p. 473.
Hemorrhage in Pulmonary Tuberculosis: Dental Focal Infection as Principal Cause. C. H. Sprague, Boise, Idaho.—p. 475.

Ohio State Medical Journal, Columbus

35: 1265-1368 (Dec.) 1939

- Present Status of Pertussis Immunization. J. G. Kramer, Akron.—p. 1281.
Lobectomy in Treatment of Bronchiectasis. G. M. Curtis, Columbus, and H. G. Knierim, Detroit.—p. 1286.
Development of Child Psychiatry as a Neuropsychiatric Specialty. O. B. Markey, Cleveland.—p. 1290.
Management of Hyperphoria. M. P. Motto, Cleveland.—p. 1295.
Use of Skin Tests in Diagnosis and Treatment of Rheumatoid Arthritis. J. R. Reeves, Columbus.—p. 1299.
Usefulness in Clinical Practice of Knowledge of Ovulation Date. J. C. Placik, Cleveland.—p. 1302.
Acute Traumatic Subdural Hematoma: Recognition and Management. S. W. Weaver, Youngstown.—p. 1305.
Tuberculous Endometritis: Report of Case. H. M. Wiley, Cincinnati.—p. 1310.
Clinical Experience in Skin Testing with Homologous Protein for Determination of Active Tuberculosis. P. T. Knies, Columbus.—p. 1313.
Glomus Tumor: Report of Two Cases. P. R. Kline, New York; M. Brody, Canton, and E. R. Brody, New York.—p. 1317.
Acquired Atelectasis. W. H. Maddox, Wauseon.—p. 1320.

Acquired Atelectasis.—Maddox points out that massive atelectasis may be caused in traumatic cases by contraction of the bronchial musculature through shock to the pulmonary nerves (vagus plus sympathetic). This causes the smallest bronchioles to collapse and their walls to adhere, much of the air in the alveoli and bronchioles having been forced out by strong contraction of the muscles of expiration and by the narrowing of the bronchi and bronchioles by contraction of the intrinsic bronchial muscles aided by contraction of elastic tissue. In some cases of postoperative collapse, bronchial plugs are present in the main or smaller bronchi. When such plugs are not present, atelectasis may occur from stasis in the pulmonary arteries. This begins in the smallest branches and is favored by impairment of the general circulation and by interference with the amplitude of respiratory movements. This in turn favors reduction in vital capacity and other factors (high diaphragm with compression of the bases, fear of pain, sedatives, the maintenance of one position and the like). All patients with post-operative pulmonary symptoms should have the benefit of repeated roentgenography.

Rhode Island Medical Journal, Providence

22: 189-202 (Dec.) 1939

- Anorexia Nervosa. G. H. Alexander, Providence.—p. 189.

Rocky Mountain Medical Journal, Denver

36: 837-942 (Dec.) 1939

- What Price Depression? R. Sleyster, Wauwatosa, Wis.—p. 854.
How Contagious Diseases Are Spread. I. A. Alt, Chicago.—p. 860.
Infections of the Neck. C. J. Baumgartner, Los Angeles.—p. 865.
Amebiasis. A. J. Chisholm, Denver.—p. 870.
Annual Report of the President: Colorado Hospital Association. J. R. Mulroy, Denver.—p. 878.

Southern Surgeon, Atlanta, Ga.

8: 445-526 (Dec.) 1939

- Indications for Hysterectomy. I. Abell and I. Abell Jr., Louisville, Ky.—p. 445.
Application of Electrically Neutral Metal in Fractures. C. S. Venable, San Antonio, Texas.—p. 456.
Optimal Period for Delay of Operation Following Appendicitis Complications. H. Mahorner and R. Vincent, New Orleans.—p. 462.
Vesicovaginal Fistula: Suprapubic Approach. R. W. McKay, Charlotte, N. C.—p. 472.
Immediate versus Delayed Treatment of Acute Appendicitis with Rupture: Statistical Study. J. L. McGehee, Memphis, Tenn.—p. 480.
Management of Salpingitis. W. R. Cooke, Galveston, Texas.—p. 488.
Open Treatment of Peritonitis Secondary to Appendicitis. H. A. Gamble, Greenville, Miss.—p. 495.
Anal Carcinoma in Situ: Report of Three Cases. P. M. Vickers, R. J. Jackman and J. R. McDonald, Rochester, Minn.—p. 503.
Lifeguards of Surgery. A. L. Lockwood, Toronto.—p. 508.

Surgery, St. Louis

6: 817-994 (Dec.) 1939. Partial Index

- Acute Traumatic Dislocation of Tendon of Long Head of Biceps Brachii: Report of Six Cases with Operative Findings. L. C. Abbott and J. B. deC. M. Saunders, San Francisco.—p. 817.
Blind Method of Nailing Fractured Femoral Necks. J. P. Cole, Buffalo.—p. 841.
*Use of Zinc Peroxide in Treatment of Diabetic Gangrene of Lower Extremities. F. L. Meleney, New York.—p. 845.
Total Cystectomy for Cancer: Critical Review. F. Hinman and D. Smith, San Francisco.—p. 851.
Cholechojejunostomy: Experimental Study After Resection of Duodenum and Seven Eighths of Stomach. W. H. Bachrach and S. J. Fogelson, Chicago.—p. 882.
Effect of Gallbladder Disease on Electrocardiogram. M. M. Weiss and J. E. Hamilton, Louisville, Ky.—p. 893.
Effect of Trauma to Liver on Plasma Prothrombin: Experimental Study. J. W. Lord Jr., New York.—p. 896.
*Effect of Hepatectomy on Plasma Prothrombin and Utilization of Vitamin K. W. D. Andrus, J. W. Lord Jr. and R. A. Moore, New York.—p. 899.
Polypoid Disease of Colon: Anatomic Measurements of Colon Including Description of Colonoscope. R. F. Hedin, Red Wing, Minn.—p. 909.
New Technic for Cutting Skin Grafts: Including Description of New Instruments. E. J. Poth, San Francisco.—p. 935.

Zinc Peroxide in Treatment of Diabetic Gangrene.

Diluted solution of sodium hypochlorite and other hypochlorites do not act favorably on tissues which have impaired circulation, as in diabetic gangrene of the extremities. They inhibit the development of granulation tissue and thus delay the reparative process. Zinc peroxide, Meleney states, markedly inhibits the growth of the hemolytic streptococci and all anaerobic bacteria, including the organisms causing gas gangrene and the anaerobic streptococci. It neutralizes or inactivates the toxins formed by these organisms and at the same time encourages the reparative process by the stimulation of granulation tissue. Zinc peroxide, which is a white powder, should be suspended in sterile distilled water and applied to every part of the wound surface. The wound should then be covered with fine meshed gauze soaked in the same material. This should be covered with compresses saturated with sterile distilled water and these compresses in turn covered with petrolatum gauze or some other impermeable material to prevent evaporation. The dressing should be changed every twenty-four hours, the old material irrigated off, and a new dressing applied. It is important to use material which has been proved to be effective in the production of oxygen, and it is essential that adequate contact be obtained between the zinc peroxide suspension and every part of the wound surface. The use of sulfanilamide is indicated in addition to the zinc peroxide if hemolytic streptococci are present. If hemolytic streptococci and anaerobic organisms are present at the site of amputation, zinc peroxide should be used as a prophylactic to prevent the development of infection in the stump, or if infection has developed it should be used as early as possible to control it. If reamputation is necessary, it should be used immediately to prevent infection in the second operative site.

Hepatectomy, Plasma Prothrombin and Vitamin K.

Andrus and his associates performed complete hepatectomy in experiments with six dogs. They say that the precipitate and continuous fall in the plasma prothrombin which followed hepatectomy is evidence that the liver, under normal conditions, is concerned in the continuous formation of prothrombin. Further evidence that the liver is the organ which, in the presence of vitamin K, forms prothrombin is that instillation of a large amount of this vitamin into the duodenum during operation fails to alter the typical decreasing curve of the plasma prothrombin after hepatectomy.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 1127-1172 (Dec. 9) 1939

- Carcinoma of Stomach. J. Walton.—p. 1127.
*Lymphatic Leukemia: Value of Sternal Puncture in Diagnosis of Atypical Cases. M. C. G. Israëls.—p. 1132.
Spread of Retroperitoneal Effusions Arising in Renal Regions. G. A. G. Mitchell.—p. 1134.
Advantages and Disadvantages of Endotracheal Anesthesia. Rosalind M. P. Milne and J. R. Mackenzie.—p. 1136.
Plea for Better Endoscopic Training. G. E. Martin.—p. 1138.

Lymphatic Leukemia.—Israëls cites five cases in which some of the classic signs of lymphatic leukemia were missing but the clue to an otherwise open diagnosis was provided by sternal marrow punctures. The sternal marrow shows a lymphocytosis even when the clinical signs and the peripheral blood pictures are atypical. This lymphocytosis is strong evidence for the diagnosis of lymphatic leukemia, as it is not usually found in other conditions.

Journal of Hygiene, London

39: 597-724 (Nov.) 1939

- Pituitary Extracts and Virus of Foot and Mouth Disease: Effect on Virus of Certain Chemical Methods Employed in Their Preparation. I. A. Galloway.—p. 597.
Cross Immunity Experiments in Monkeys Between Variola, Alastrim and Vaccinia. E. S. Horgan and M. A. Haseeb.—p. 615.
Vitamin B₁ Excretion on Varied Intake. Margaret D. Wright and Audrey Z. Baker.—p. 638.
Some Effects of Prolonged Vitamin E Deficiency in Rat. A. J. P. Martin and T. Moore.—p. 643.
Value of Sodium Dextrotartrate Fermentation Test in Differentiation of Salmonella Organisms. S. W. Challinor and A. J. Rhodes.—p. 651.
Significance of Occurrence of Bacteriophage for Dysentery Bacilli in Water Supplies. A. J. Rhodes and M. Ludlam.—p. 658.
Some Factors Influencing Spread of Scarlet Fever in an Institution. E. V. Keogh, I. Macdonald, Joan Battle, R. T. Simons and S. Williams.—p. 664.
*Sensitization to Flour and Flour Illnesses Among Flour Workers. H. A. E. van Dishoeck and D. J. Roux.—p. 674.
Immunity Following Intracutaneous and Subcutaneous Vaccination with Elementary Body Suspensions of Vaccinia. R. G. Henderson and D. McClean.—p. 680.
Control of Air-Borne Bacteria and Fungus Spores by Means of Aerosols. R. J. V. Pulvertaft and J. W. Walker.—p. 696.
Influence of Emulsions of Olive Oil on Biologic Actions of Alkaloids. G. N. Myers.—p. 705.

Sensitization of Bakers to Flour.—Van Dishoeck and Roux estimated the occurrence of asthma, vasomotor rhinitis and eczema due to sensitization to wheat, rye, oat, corn or/and other flour among 262 unselected bakers and millers. All these workers were tested with the scratch method. A large number of persons were also tested for sensitiveness to ammonium persulfate. Sixty-six (25 per cent) of the bakers and millers were sensitive to flour. Among the 196 flour workers with negative reactions, ailments of the respiratory tract or eczema were exceptionally rare. On the other hand nearly all the sixty-six workers with positive cutaneous reactions were suffering or had suffered from one or more flour illnesses. Omitting exceptional cases, it seems that the flour illnesses, vasomotor rhinitis, asthma and eczema, are usually associated with positive cutaneous reactions to flour proteins. Of the sixty-six hypersensitive persons fifty-two gave positive and fourteen negative reactions to wheat flour. These fourteen reactors were sensitive only to oat or to rye flour. If investigations had been restricted to wheat only negative results would have been obtained in 21 per cent of the cases of flour illness. Hypersensitiveness to flour is most probably an inhalation allergy like that due to dust or pollen. From the personal histories of the sensitized flour workers, symptoms had developed in 37 per cent within the first five years of employment and within ten years in the remainder. Bakers, in small bakeries especially, were sensitized when still young. Only ten of the thirty patients with active eczema tested gave a positive reaction to ammonium persulfate. Therefore ammonium persulfate does not appear to be the primary cause in every case of flour hypersensitiveness, as suggested by some workers. On the contrary, the authors think that sensitization to flour is the main cause of the flour illnesses, including flour eczema, and on this ground in some cases an epithelial persulfate hypersensitiveness also develops. In all their cases of persulfate hypersensitiveness a strong positive flour hypersensitiveness was present. The

observations suggest that improvement in the hygienic conditions in bakeries, especially in the small ones, is desirable and that early allergic examinations of the bakers might be useful in detecting impending illnesses due to flour. Desensitization with the extremely potent proteose constituent of wheat, with encouraging results, has been tried.

Lancet, London

2: 1205-1252 (Dec. 9) 1939

- The Apposable Thumb. W. Langdon-Brown.—p. 1205.
*Systolic Clicks Due to Left-Sided Pneumothorax. J. G. Scadding and P. Wood.—p. 1208.
Tragedy of Footwear. E. A. Lindsay.—p. 1211.
Antistreptolysin S Titers in Rheumatic Fever. E. W. Todd, A. F. Coburn and A. B. Hill.—p. 1213.
Exophthalmos in Graves's Disease Despite Sympathetic Paralysis. W. R. Brain.—p. 1217.
Preservation of Stored Blood. M. Maizels and N. Whitaker.—p. 1219.
Pernicious Anemia in Child. W. L. Templeton.—p. 1221.

Systolic Clicks Due to Left-Sided Pneumothorax.—Scadding and Wood, in the past two years, have observed cases which presented extra sounds during the cardiac cycle in association with shallow left-sided spontaneous pneumothorax. The extra sounds were of a clicking character and were usually best heard in the region of the apex beat. The sounds were usually single clicks and then occurred in the systolic part of the cycle; occasionally a more complex extra sound during systole or an additional less prominent diastolic sound of similar character might be heard. The systolic clicking element was the most striking. The sounds varied both in intensity and in timing with small changes in posture and were at times loud enough to be audible to the patient and to bystanders. The pneumothorax was of the benign nontuberculous type and was absorbed without incident, the sound disappearing when the pneumothorax was absorbed or earlier. The clicks have not been heard in association with larger pneumothoraces. In four cases of exudative pulmonary tuberculosis of limited extent, which were to be treated by left-sided artificial pneumothorax, the induction was performed with a smaller volume of air than usual and careful observation made during and after induction for the occurrence of extra sounds. In two of the four cases loud systolic clicks were produced. In the other two, though soft extra sounds were transiently audible on careful auscultation in various postures, they were not striking enough to be comparable with the sounds heard in the cases of spontaneous pneumothorax. The authors review the two cases of artificial pneumothorax in which the loud systolic clicks were heard. The sounds produced in these cases were similar in quality and timing to those observed in the cases of spontaneous pneumothorax. In both cases the introduction of more air rapidly caused the extra sounds to disappear. The authors point out that previously recorded cases in which transient loud noises synchronous with the heart beat were associated with the sudden onset of pain and dyspnea and with the appearance of air in abnormal situations in the tissues seem to fall into two distinct groups: (1) sounds in association with left-sided pneumothorax and (2) sounds in association with mediastinal emphysema. When the sounds were crunching, churning or crackling and might be heard as well in diastole as in systole, interstitial emphysema of the mediastinum was constantly present. The mechanism of production of the sounds in mediastinal emphysema is obvious. In shallow left-sided pneumothorax, the authors think the sounds are made by the forcible separation of the visceral and parietal pleurae during cardiac systole, when the small air bubble in the pleura is in such a position that it can be moved by the cardiac pulsations—a mechanism similar to that of production of the consonant t. This hypothesis explains the presence of the sound only with small pneumothoraces, its disappearance if more air is introduced, and its extreme sensitivity to changes in posture. Several other hypotheses have been advanced to explain these sounds. Regarding the clinical importance of the extra sounds, the authors say that the syndrome may be most alarming to the patient and to his relations and may mislead the physician into making a diagnosis carrying a grave prognosis; for, unless the peculiar nature of the added sound suggests the advisability of x-ray examination, the spontaneous pneumothorax is likely to remain undiagnosed. The syndrome is of interest also in relation to systolic gallop rhythm.

Proceedings of Royal Society of Medicine, London

32: 1551-1722 (Oct.) 1939

- Observations on Epidemic of Cerebrospinal Meningitis in Cyprus and Record of Prophylactic Experiment. I. H. Maclean and C. E. Bevan.—p. 1551.
- Pelvic Osteo-Arthropathy of Pregnancy. J. Young.—p. 1591.
- Effect of Inclination of Pelvic Brim and Shape and Inclination of Upper Sacrum on Passage of Head Through Upper Pelvis. P. Malpas and C. J. K. Hamilton.—p. 1597.
- Bilateral Keratitis and Cylitis Due to Filaria Infection in European from Kenya: Case. A. H. Levy.—p. 1620.
- Ascertainment of Deafness and Ear Disease in Children. T. C. Lonie.—p. 1632.
- Position of Portmann Operation in Relation to Labyrinthine Vertigo. E. M. Woodman.—p. 1642.
- *Histologic Changes in Temporal Bones of Case of Ménière's Disease. C. S. Hallpike and A. J. Wright.—p. 1646.
- Discussion on Prolapsed Intervertebral Disks. J. G. Love.—p. 1697.

Histologic Changes in Ménière's Disease.—In a previous article Hallpike and Cairns gave a description of the pathologic observations in the temporal bones of two typical subjects of Ménière's syndrome. Certain peculiar changes were disclosed in the labyrinth and the changes were considered to support the view that the disorder was due to specific disease of the labyrinth itself. The pathologic changes of the temporal bones of a third case, examined by Hallpike and Wright, are reported. On examination the tympanic membranes were normal, and hearing distance for the conversational voice was apparently normal on the right side but on the left side it was reduced to 6 feet. Bone conduction for a tuning fork was diminished on the left side and the audiogram showed a considerable high tone loss on the left side with normal hearing on the right. The tonsils were enlarged and grossly infected, and clinical and x-ray examination showed a bilateral antral sinusitis. The tonsils were removed and an intranasal opening was made into the antrum below the inferior turbinal on either side and in addition a limited submucous resection of the septum was performed to facilitate antral drainage. The patient eventually died, five weeks after the operation, as a result of repeated secondary hemorrhages. In the previous report the view was advanced that the primary mechanism of the disease was an obstructive distention of the endolymph system. This distention occurred in the present case. The peculiar nature of the changes makes it reasonable to regard them as constituting the essential morbid anatomy of a specific disease of the labyrinth. The relatively slight degree of the endolymphatic distention in the present instance and the absence of changes in Corti's organ or in the stria vascularis such as were disclosed in both of the cases previously reported are considered in greater detail. In both particulars it seems likely that the principal factor involved was the short duration of the disease. Six months elapsed between the first attack of vertigo and death. With regard to the extent of the endolymphatic distention, in the two previous cases the blocking of the scala vestibuli by the distended scala media was complete and this, it was suggested, was an essential part of the mechanism of the vertiginous attacks. This suggestion does not appear to be supported by the finding in the present subject of an incomplete distention of Reissner's membrane. Nevertheless the possibility exists that the distention found might well be subject to a rapid increase to the point of complete obliteration of the scala vestibuli and that such an increase might occur within a prodromal period of some hours preceding an attack of vertigo. This possibility is supported by the finding of marked folds in Reissner's membrane and for this reason it does not seem necessary at present to discard the suggestion in question. As to the absence in the present subject of changes in Corti's organ or in the stria vascularis, in addition to the minor character of the microscopic changes which would be likely to occur in the early stages of the disease, account must also be taken of a certain transience of these changes which would well accord with the fluctuating character of the deafness emphasized by Crowe. Such transience on the part of the changes in Corti's organ introduces a chance factor which would play an important part in determining the results of microscopic examination. Should this factor operate unfavorably then it seems likely that the minor changes which may be present in Corti's organ in the early stages of the disease will always defy microscopic demonstration, particularly when, as in the present instance, they are further obscured by the artefacts of postmortem degeneration.

Archives des Maladies du Cœur, Paris

32: 849-944 (Sept.-Oct.) 1939

- Lack of Ventricular Subordination in Partial or Atypical Auriculo-ventricular Blocks: Aspects and Significance. R. Froment, R. Masson and A. Gouin.—p. 849.
- *Primary Arterial Hypertension (Benign Nephro-Angiosclerosis) Treated by Complete Nervation of Left Kidney and Section of Splanchnic with Concomitant Adrenalectomy: State of Renal Function After Ten Months. R. Fontaine and G. Mayer.—p. 860.
- Hypovitaminosis B₁ and Cardiopathies: III. Aggravating Action of Deficiency in Vitamin B₁ on Cardiac Disturbances of Patients with Exophthalmic Goiter and Diabetes and on Banal Cardiopathies. G. Bickel.—p. 869.
- Action of Theophylline with Ethylenediamine on Intra-Arterial Pressure of Man. J. Lequime and J. van Heerswynghe.—p. 879.
- Ventricular Tachycardia and Partial Block in Course of Myocardial Infarct. P. Szekely.—p. 887.
- Investigations on Quantity of Circulating Water in Blood Plasma. J. Fliederau.—p. 893.

Surgical Treatment of Arterial Hypertension.—Fontaine and Mayer review the clinical history of a woman aged 54 who had had hypertension for more than ten years and who had had already three cerebral attacks with paralysis aphasia and other symptoms. The treatment consisted of adrenalectomy, splanchnicectomy, with high lumbar sympathectomy, all associated with denervation of the renal pedicle, with ablation of the aorticorenal ganglion and completed by decapsulation. The operation was made only on the left side. After the operation the arterial tension decreased, but later there was again a progressive increase up to the preoperative figures. However, the functional amelioration persisted at the end of ten months. The benefit which the patient derived from the operation is manifested especially by the suppression of certain disagreeable subjective symptoms, such as headaches, giddiness and murmurs. Furthermore, the paroxysmic hypertensive crises, which represent such a grave danger for patients with permanent hypertension, disappeared after the operation.

Presse Médicale, Paris

47: 1569-1584 (Nov. 25-29) 1939

- *Differential Diagnosis of Arterial Embolisms of Members. P. Funck-Brentano.—p. 1569.
- Influence of Dehydration in Surgery. J. Bottin.—p. 1572.
- Present Condition of Tuberculous Patients Surviving from Last War. H. Mollard.—p. 1574.
- Action Mechanism of Cardiotonics. J. Steff and V. Kolar.—p. 1575.

Differential Diagnosis of Arterial Embolism.—Funck-Brentano says that in the presence of an acute arterial occlusion an early etiologic diagnosis is of vital importance, because only extreme rapidity of diagnosis permits the proper treatment, which alone makes it possible in most cases to preserve the function, prevent gangrene and avoid amputation and the resulting cardiac decompensation. Reviewing the clinical symptoms that are accepted as typical he mentions among the subjective signs the brutal pain, which is at first localized and then spreads toward the distal portion of the member; also the sensation of cold and the numbness in the member. Of the objective signs he mentions disappearance of the pulsation, discoloration of the skin, local cutaneous coolness, diminution or abolishment of the reflexes, abolition of movements and perturbation in the sensibility. He also stresses oscillometry as an important diagnostic aid. However, in spite of this wealth of symptoms the differential diagnosis of arterial embolism remains extremely difficult, and the author does not share the optimistic assurance of many surgeons who regard the diagnosis as easy. To explain his stand he reviews the following points: 1. Examinations like oscillometry may lead to errors. 2. The picture of arterial embolism may differ greatly from that regarded as classic. 3. The classic picture of arterial embolism can be realized by lesions other than embolism. In this connection the author points out that phlebitis and arteritis may exhibit symptoms similar to arterial embolism. 4. The anamnestic information does not always suffice to affirm the origin of arterial occlusion.

Revue Belge des Sciences Médicales, Louvain

11: 297-336 (Aug.-Sept.) 1939

- Hematologic Investigations on Medullary Biopsy. W. de Weerd.—p. 297.
- *Antithyroid Action of Estrogen in Clinic. J. Lederer.—p. 326.

Antithyroid Action of Estrogen.—Lederer points out that the frequent appearance of goiter in women at puberty, gestation, lactation or the menopause directed attention to the relation between the ovary and the thyroid. Furthermore it has been

observed that, in exophthalmic goiter as well as in myxedema, disturbances of menstruation are likely to occur. Although the existence of a relation between ovaries and thyroid cannot be doubted, its mechanism is complex and abounds in contradictions. Following a brief review on the effect of injections of estrogen on the activity of the thyroid, the author reviews the history of a woman aged 36 who had been well until ten years before, when an exophthalmic goiter developed which failed to yield to medical treatment and later subtotal thyroidectomy was performed. The patient improved so that she could resume her normal activities. Several years later adnexitis developed and total hysterectomy became necessary with bilateral ovariectomy. Following this the symptoms of exophthalmic goiter recurred. Various measures such as roentgen therapy, compound solution of iodine, diiodotyrosine and even estrogen in a quantity of 10,000 units a week failed to improve the symptoms of exophthalmic goiter. Then it was decided to try estrogen alone in large doses. The individual dose was 5 mg. During the first week 25 mg. was given, during the second and third weeks 20 mg. each, during the fourth week 15 mg., during the fifth week 10 mg., and during the sixth to eighteenth week 5 mg. each. This treatment produced a rapid improvement. The author admits that it would go too far to conclude from this case that estrogen is the future treatment of hyperthyroidism. However, in the cases in which ovarian and hypophyseal dysfunction are involved, estrogen might be helpful.

Dermatologica, Basel

80: 65-128 (Aug.) 1939. Partial Index

- *Treatment of Psoriasis with Diet Deficient in Potassium and with Extract of Adrenal Cortex. C. K. Incedayi and Berta Ottenstein.—p. 65.
Disappearance of Generalized Vitiligo After Antisypilitic Cure with Irradiations with Natural Sunlight. A. Ackermann.—p. 81.
Is There a "Genuine" Psoriasis Carcinoma? J. Burgener.—p. 86.
Tularemia. P. Robert.—p. 98.

Treatment of Psoriasis.—Incedayi and Ottenstein investigated the cholesterol metabolism in three cases of psoriasis. In view of the fact that recent opinions localize the disturbance in the lipid metabolism not only in the liver but also in the adrenals, the authors decided to try treatment with a preparation of adrenal cortex in combination with a diet that was deficient in potassium. The effect was surprisingly favorable in all three cases. However, no conclusions concerning the etiology of psoriasis can be deduced from these observations.

Schweizerische medizinische Wochenschrift, Basel

69: 1197-1216 (Nov. 25) 1939. Partial Index

- Electrical Injuries of Oral Cavity. E. Oppikofer.—p. 1197.
Benign Pharyngeal Angina with Splenic Tumor Caused by Bacillus Funduliformis. A. Grumbach, E. Liebmann and H. Schindler.—p. 1198.
Stages of Reaction in Course of Rheumatic Infection. E. Traub.—p. 1200.
*Premenstrual Salivary Syndrome. W. Racine.—p. 1204.

Premenstrual Salivary Syndrome.—Racine presents brief histories of four women who observed tumefaction of their salivary glands four or five days before the onset of menstruation. The swelling subsided with the onset of the flow. In one woman the two submaxillary glands were swollen, in another one the two parotid glands and in the other two one parotid and one submaxillary gland. Simultaneously the women had an abnormal swelling of the breasts. It is noteworthy that all the women had undergone gynecologic interventions (unilateral ovariectomy, curettage or ligation of the tubes). The premenstrual appearance of the swelling of the salivary glands suggests a connection with the ovarian function and the author reasons that an insufficiency of the corpus luteum hormone is responsible. Consequently he decided to give injections of progesterone every other day during the ten days preceding the onset of menstruation. These injections prevented the appearance of the tumefaction of the salivary glands as well as the swelling of the breasts. One of the women was given the treatment four times with the result that for two years now the salivary symptom has not reappeared. Two other patients have to repeat the treatment during every premenstrual period, otherwise the salivary symptom returns. Although the treatment of the fourth patient prevented the appearance of the salivary symptom, the treatment was contraindicated because it diminished the diuresis and augmented the edemas; this patient had chronic nephritis.

Accademia Medica, Genoa

54: 517-584 (June) 1939. Partial Index

- Pathology from Abnormalities of Veins of Dura Mater: Clinical and Operative Study. O. Balduzzi, U. Sacchi and T. Lazzeri.—p. 522.
*Glycemia and Glycorrhachia After Insulin Loading in Diabetes. G. Vite.—p. 537.

Glycorrhachia After Insulin Loading in Diabetes.—Vitale followed the behavior of dextrose in the blood and the cerebrospinal fluid of ten patients who were suffering from diabetes mellitus. The repeated determinations were done by the Hagedorn-Jensen method, before and after administration of a subcutaneous injection of 40 units of Richter insulin. The author found that the amount of dextrose in the cerebrospinal fluid of diabetic patients is increased in comparison with normal figures (0.001 and 0.0005 Gm. of sugar respectively to each hundred cubic centimeters of cerebrospinal fluid). Dextrose in both the cerebrospinal fluid and the blood diminish after administration of the injection of insulin. Diminution begins simultaneously. It takes place rapidly and in moderate figures in the blood and slowly and in large figures in the cerebrospinal fluid. The lowest figures of dextrose in the blood appear two or three hours after injection of the insulin, after which glycemia increases again. The lowest figures of dextrose in the cerebrospinal fluid appear five or six hours after the injection and when glycemia has been for several hours near the figures existing before the injection. In one of the cases a comatose condition, lasting about twenty minutes and spontaneously subsiding, developed during the few minutes that glycorrhachia was at the lowest figures (almost an absence of dextrose in the cerebrospinal fluid) and glycemia was near those existing before the injection of insulin.

Ateneo Parmense, Parma

11: 187-302 (July-Aug.) 1939. Partial Index

- *Operation for Calculi of Pelvic Segment of Ureter. R. Brancati.—p. 187.
Syndrome of Nasociliaris Nerve (Charlin's): Cases. F. Caldera.—p. 215.
Cirsoid Aneurysm: Critical Study. L. Novara.—p. 283.

Removal of Calculi from Pelvic Segment of Ureter.—Brancati's operation is a modification of Bergmann's ureterolithotomy. It is performed under spinal anesthesia and consists of incision of the abdominal wall exactly on the inguinal canal (on the side of the calculous ureter, the incision being made from the anterior iliac spine to the external edge of the external muscle), opening of the inguinal canal and of the fascia transversalis, section of the epigastric blood vessels (previously ligated), separation of tissues of the pelvic peritoneum so as to have the ureter isolated from the tissues, incision of the ureter, removal of the calculi, suture of the ureter with catgut, and plastic reconstruction of the canal and of the abdominal wall by Bassini's technic (which is used in the reconstruction of the structures after operation for inguinal hernia). When drainage is resorted to the reconstruction of the abdominal wall is performed by Mugnai's technic. The author reports six cases with calculi at either the right or the left pelvic segment of the ureter of either sex, with satisfactory results from the operation.

Prensa Médica Argentina, Buenos Aires

26: 2413-2460 (Dec. 13) 1939. Partial Index

- *Blood Transfusion with Large Doses of Arsphenamine in Grave Puerperal Infection. A. Peralta Ramos and A. A. Montes.—p. 2419.
Bilateral Bronchiectases: Insufficient Left Lower Lobectomy. R. Finocchio, A. Rissotto and H. D. Aguilar.—p. 2426.

Blood Transfusion with Arsphenamine in Puerperal Infection.—Peralta Ramos and Montes report satisfactory results from blood transfusion containing large doses of arsphenamine in six cases of grave puerperal infection. Sulfanilamide and immunotransfusion had previously failed in all cases. The technic is as follows: Arsphenamine 1.5 Gm. is dissolved in from 3 to 4 cc. of dextrose solution, which is added to from 200 to 300 cc. of weakly citrated blood (20 cc. of a 2 per cent solution) for further dilution and then administered to the patient by slow transfusion. The ampule which contains the injecting solution is placed at a height of 1.6 meters. The blood is administered by the drip method with a needle 1.8 mm. in diameter (never larger). It is given at a rate of twenty drops a minute so as to instill a dose of 0.01 Gm. of the drug a minute. Lowering of the temperature of the injecting solution during transfusion should be prevented. At the

end of the transfusion (through the same needle) from 50 to 80 cc. of a hypertonic solution of dextrose is administered and an intramuscular injection of 0.1 Gm. of vitamin C and extract of total liver is given. The treatment is repeated on the following day. The treatment was well tolerated and successful. Two treatments were administered in all cases, in spite of the fact that control of the symptoms and of the infection became evident immediately after administration of the first transfusion with arsphenaminized blood.

Revista Médica de Rosario, Rosario de Santa Fe

29: 1151-1276 (Nov.) 1939. Partial Index

Functional Mastopathy. J. Benzonon.—p. 1158.

*Treatment of Acute Gonorrheal Urethritis. V. A. Gorla.—p. 1198.

*Hyperthyroidism Without Goiter. C. Alvarez.—p. 1209.

Gonococcus Vaccines in Acute Gonorrhea.—Gorla used Nicolle and Blaizot's vaccine, which contained between 200,000,000 and 1,500,000,000 gonococci, in seventy-five cases of acute urethritis with or without complications. The vaccine was given every other day or at intervals of two days up to six doses, after which lavages were given for one month if the urethral secretion persisted. Of forty-nine cases of acute urethritis without complications the gonococcus disappeared from the urethral secretion before ten days in thirteen, before twenty days in twenty and after twenty days in sixteen. The secretion stopped before one month in twenty-three cases and after a month in twenty-six cases. In six cases each of acute urethritis with orchiepididymitis or cystitis and in three cases of urethritis with cystitis, clinical and bacteriologic recovery was obtained before two months. In all cases the satisfactory results have lasted from six months to two years after discontinuation of the treatment. Urethral secretion is not present in any of the cases. According to the author gonococcus vaccines, when administered intravenously, give better results than when administered otherwise. It is advisable not to prevent shock from the vaccines, as it is specific and of therapeutic value. Gonococcus vaccines cannot be administered intravenously to ambulatory patients. The patient has to rest in bed for the first few days of administration of the treatment and again on the day on which the vaccine is administered. The contraindications are heart disease, tuberculosis, asthma, cardiorenal diseases and old age.

Hyperthyroidism Without Goiter.—Alvarez studied a large number of cases of hyperthyroidism in the absence of goiter. He calls attention to the frequency of the condition in the presence of various diseases, infections and physiologic phases of life, especially tuberculosis, pure arterial hypertension and the menopause.

Archiv f. exper. Pathologie u. Pharmakologie, Berlin

193: 377-504 (Oct. 24) 1939. Partial Index

Pharmacology of Extrapyramidal System. A. G. Beer.—p. 377.

Microscopic Examination of Brains of Three Cats Without Neocortex.

Gertrud Bergner.—p. 408.

*Influence of Ultraviolet Radiation on Epinephrine and Epinephrine-like

Bodies. H. Konzett and W. Weis.—p. 440.

Problem of Tachyphylaxis. H. G. Rietschel.—p. 454.

Modification of Quantity of Urine and of Elimination of Minerals by

Subcutaneous Injection of Distilled Water: Studies on Rats. H.

Vollmer and A. Irmer.—p. 474.

Remarks on Technic of Diuresis Experiment, Explained on Basis of Some

Caffeine Tests. H. Vollmer.—p. 483.

Action of Ultraviolet Radiation on Epinephrine.—Konzett and Weis point out that Ewing and his collaborators, in examining the action of ultraviolet radiation on epinephrine, synephrin and ephedrine, observed a contradictory behavior. Whereas epinephrine was found to lose its intensifying action on the blood pressure and the blood sugar, the efficacy of synephrin was found to increase in this respect. Ephedrine responded like epinephrine with a loss. Ewing and his co-authors assumed that this change in action was due to oxidative processes but made no attempt to explain the contradictory results in epinephrine and synephrin. Konzett and Weis assume that the change in the action of synephrin is due to the fact that epinephrine is formed in it under the action of ultraviolet rays. In this paper they report experiments which they carried out to explain this problem. Summarizing their observations they state that epinephrine loses its blood pressure action as the result of ultraviolet irradiation. The fluorescence of the epinephrine solu-

tions decreases in the same measure as does the blood pressure action. Under the influence of ultraviolet irradiation, the epinephrine solutions assume at first a reddish color, then a reddish yellow one and finally they again become colorless. The destruction of epinephrine takes place even under exclusion of oxygen. From synephrin there develops under the influence of ultraviolet rays a body with an intense pressor effect, which on biologic and chemical analysis proved to be epinephrine. The maximal value of epinephrine in the irradiated synephrin solutions amounts to from 8 to 10 per cent of the originally existing synephrin; in the concentrated solutions this maximum is obtained later than in the diluted ones. However, under ultraviolet irradiation epinephrine is not only formed but also destroyed in synephrin solutions. At first its formation predominates, but later with growing exhaustion of the stores of synephrin the destruction of epinephrine predominates. Oxygen is absolutely necessary for the transformation of synephrin into epinephrine.

Klinische Wochenschrift, Berlin

18: 1381-1404 (Oct. 28) 1939. Partial Index

Cardiac Insufficiency and Coronary Insufficiency. E. Edens.—p. 1381.

*Problem of Oxygen Intoxication. H. Becker-Freyseng and H. G.

Clamann.—p. 1382.

Agastria Anemia. G. Monasterio.—p. 1385.

Theory of Takata Reaction. Ilse Markoff.—p. 1389.

Cocarbonylase Content of Human Blood. F. Widenbauer.—p. 1392.

Biologic Gordon Reaction. D. Barbieri.—p. 1394.

Oxygen Intoxication.—Becker-Freyseng and Clamann direct attention to the fact that an oversupply of oxygen can be harmful for the animal organism. This observation, which was made by Lavoisier in 1794, was subsequently corroborated by others. Following a brief review of the literature the authors report their own observations in experiments on themselves and on animals. They stayed for sixty-five hours in a chamber the air supply of which contained 90 per cent of oxygen. Rabbits, guinea pigs and mice were subjected to the same conditions, but the authors discuss chiefly the observations made on themselves. During the first twenty-four hours they had no complaints, but changes in the alveolar carbon dioxide tension developed almost immediately after the onset of oxygen inhalation. At the end of twenty-four hours pathologic changes appeared; there were nervous symptoms, such as formication in the fingers and toes and paroxysmal tachycardia. After about sixty hours one of them had attacks of vomiting, which was probably of central origin. Pulmonary symptoms were absent in one case but in the other one symptoms of febrile bronchitis developed and the vital capacity was simultaneously reduced from 4,000 to 2,700 cc., probably as the result of hyperemia of the lung. The observations on healthy human subjects corroborate those made in animal experiments. As in animals, the changes are noticeable in the respiratory tissue of the lung, in the central nervous system and in the blood. After discussing the probable mechanism of the pulmonary and hematic changes, the authors say that the fever, the leukocytosis with deviation to the left, the increased sedimentation speed of the erythrocytes and the febrile increase in the pulse rate are secondary complications of the inflammatory changes in the pulmonary tissue. The question why there were differences in the reactions of the two persons cannot be definitely decided. The authors regard it as more important that both had a decreased vital capacity as the manifestation of inflammatory changes in the lungs and that both had nervous symptoms.

18: 1405-1436 (Nov. 4) 1939. Partial Index

Psychiatric Aspects of New Marriage Law. K. Ernst.—p. 1405.

*Therapy of Intoxications Caused by Soporifics: Question of Action of Intravenous Injection of Large Doses of Metrazol. A. Heinrich.—p. 1410.

Neurohistologic Studies on Pigeons Impaired by Disethyl (Sulfanil-

amide). E. Beck.—p. 1416.

Coronary Insufficiencies in Extrarenal Azotemias. P. Gömöri and

Z. von Gruber.—p. 1417.

Difference in Action Between Stilbestrol and Follicular Hormone. J. J.

Duyvené de Wit.—p. 1423.

Metrazol in Intoxications Caused by Soporifics.—In the last eighteen months, forty-two cases of poisoning with soporifics were treated at Heinrich's clinic by intravenous injections of metrazol. Other patients with the same type of poisoning were treated with the customary procedures. All of the forty-two patients who were treated with metrazol had lost consciousness and were entirely unresponsive. The author thinks that although the number of cases treated with metrazol is compara-

tively small, the favorable results which were produced cannot be regarded as accidental. Four patients were not benefited, but three of these were moribund at the time of hospitalization. In comparing the results of metrazol therapy with those of other therapeutic methods, the author found that the mortality from intoxications with soporifics is much lower after treatment with metrazol than with other methods. The majority of the patients responded to a single intravenous injection of from 3 to 5 cc. of a 10 per cent solution of metrazol. This is the dose which the author administers to patients who are unconscious but who react to pinching. The patients who are unresponsive to pinching are given from 8 to 10 cc. of metrazol. If this injection does not awaken the patient, a second injection is made after a short interval (about fifteen minutes) with the same or a slightly larger dose. If signs of convulsion are apparent after the first injection, the second dose should be smaller (5 cc.). If awakening does not follow after a second or even a third injection, treatment should be restricted to measures which support the circulation. However, even the patients who do not respond to two or three injections at short intervals should be given at least two or three injections of large doses of metrazol in the course of the day. With this treatment, awakening may perhaps be obtained in from two to three days. The reviving effect largely depends on the rapidity of the injection; that is, a small dose rapidly injected produces the same result as a large dose that is injected slowly. As in the convulsion therapy with metrazol, the rate of injection is usually 1 cc. a second; but sometimes the injection is made with greater speed. The author watched for complications resulting from this treatment and found that epileptiform attacks may result from excessive doses or from too rapid injection but that they are of no importance, for in these intoxicated persons the convulsions are not as severe or as lasting as they are in persons who are not under the influence of narcotics. The electrocardiogram is not changed by the intravenous injection of large doses of metrazol. The author emphasizes that the treatment is not suited to patients with carbon monoxide poisoning or to patients with morphine intoxications. However, in severe cases of alcohol intoxication the intravenous injection of from 3 to 5 cc. of metrazol proved effective.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

106: 377-596 (Oct. 10) 1939. Partial Index

- Biologic Evaluation of Vitamin A. C. Bomskov.—p. 377.
Investigations on Alcohol Metabolism. E. Danopoulos.—p. 396.
Course of Daily Blood Sugar Curve During Fasting, During Fluid Intake and During Normal Intake of Food. F. A. Meyer.—p. 409.
Influence of Increased Calcium or Potassium Content of Blood on Electrocardiogram of Healthy Subjects. M. F. von Dungern and H. J. Fundner.—p. 433.
New Method for Evaluation of Sedative Substances. F. E. Koch.—p. 445.
Problem of Inhibitory Action of Spleen on Bone Marrow. P. Jombres.—p. 457.
Fluctuations in Blood Pressure and Fibrinogen. L. Goreczky and G. Berencsi.—p. 495.
*Influence of Cold on Carbohydrate Metabolism. K. Samaras.—p. 510.

Influence of Cold on Carbohydrate Metabolism.—Samaras carried out experiments on the effects of cold on carbohydrate metabolism in male white rats. Several days before the experiments the animals were given a diet with a high carbohydrate content and five hours before they were given 0.5 Gm. of dextrose for each hundred grams of body weight. The dextrose in the form of a 25 per cent aqueous solution was introduced through the stomach tube. This dextrose was given in order to effect a maximal filling of the carbohydrate depots. Twenty-four hours before the cooling experiment the urine of the animals was tested for creatine and only those were used in which the urine was free from creatine. Immediately before the cooling experiment the temperature of the animals was measured. The cooling was effected by placing the rats in water that had a temperature of from 2 to 3 C. (35.6 to 37.4 F.). Care was taken that the head was not under water. The animals remained in the cold water for from five to ten minutes. First there were violent movements with the extremities, then the animals became fatigued and finally they fell into a collapse-like faint. After withdrawal from the water, the temperature was determined at definite intervals. To determine the changes in the glycogen content of liver and muscles, groups of five animals each were killed after intervals of one, two, four, nine, twenty-four and

thirty hours. The author found that the sudden reduction of the body temperature to less than 22 C. (71.6 F.) produces a temporary moderate increase in the blood sugar content, an almost complete disappearance of hepatic glycogen and reduction in the muscular glycogen amounting to almost 50 per cent. Finally there is a creatinuria which persists for from two to three days. These are manifestations of the chemical heat regulation, which aims to restore the lost heat as soon as possible. New heat is formed first by the combustion of the preformed stores of carbohydrates in the organism. However, it seems probable that the combustion of sugar plays an important part only immediately after the cooling process. Many factors indicate that the combustion of fat soon takes the place of the sugar combustion and that most of the newly formed heat can be traced to fat combustion.

Nordisk Medicin, Helsingfors

4: 3421-3500 (Nov. 25) 1939. Partial Index

Norsk Magasin for Lægevidenskaben

- *Fatal Traumatic Disorders of Brain, Especially Berner's Hemorrhages in Medulla Oblongata and Their Medicolegal Significance. F. Harbitz.—p. 3441.
Case of Death During Treatment with Arsphenamine: "Apoplexie Sereuse." K. Rambøl.—p. 3447.

Traumatic Disorders of Brain and Their Medicolegal Significance.—Harbitz discusses the anatomic manifestations in 165 cases, including sixty-two necropsies which he himself made. Epidural and extradural hemorrhages occurred in twenty-seven cases, with simultaneous hemorrhages in the interior of the brain in only four. Subdural hemorrhages were found in ninety-three cases and were massive in nineteen; intermeningeal or subarachnoid hemorrhages occurred in 112 cases, often with subdural and cortical hemorrhages. Cortical hemorrhages were seen in most of the cases. "Central" hemorrhages were established in the central ganglions in eighteen of his personal cases, and simultaneously or independently in the pons varolii or around the aqueduct of Sylvius in sixteen, in all in about one third of his cases. These hemorrhages were regularly found in connection with fracture of the skull and bleeding in the brain membranes and in the cortex; they were usually inconsiderable, were perivascular and under the ependyma and in most cases were demonstrable only microscopically. Hemorrhages in the medulla oblongata appeared in twenty-three of his personal cases, or about 37 per cent. They were often absent in cases with small lesions of the head and especially when there were simultaneous lesions of the chest and abdomen with internal hemorrhage. Usually they were demonstrable only microscopically and were perivascular, without destruction of nerve tissue, with simultaneous perivascular hemorrhages in other central parts of the brain. There were regularly other marked intracranial changes: large skull fractures, hemorrhages, often considerable, in the brain membranes and especially large cortical hemorrhages and now and then general brain edema. The author assigns little significance from the medicolegal point of view to the inconstant perivascular hemorrhages and asserts that similar hemorrhages have been established in the medulla oblongata in cases of sudden nontraumatic death and have been absent in cases of fatal trauma of the head with symptoms of concussion. He does not regard the base of the fourth ventricle as a place of predilection for such hemorrhages and did not in any of the 165 cases find an isolated massive hemorrhage in the medulla oblongata which could be considered as certainly or very probably of traumatic origin and the cause of death. Five so-called nearly pure cases of concussion of the brain are described, in which, mainly by microscopy, small hemorrhages were established in various parts of the brain, not usually in the medulla oblongata. In his opinion no definite anatomic changes can be regarded as the essential and certain cause of the symptoms of concussion of the brain. He stresses that brain edema when present is an expression of general circulatory disturbance of great importance in explaining the phenomena and eventually the cause of death. He doubts that fatal traumatic disturbances of the brain occur without anatomic changes and maintains that on the whole there is no sharp division from the anatomic point of view between concussion of the brain and concussion.

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FIFTEEN YEARS' OBSERVATION OF CHILDREN WITH RHEUMATIC HEART DISEASE

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PHILADELPHIA

It again seems of interest to present a summary of our results at the Children's Heart Hospital of Philadelphia in caring for children who have been admitted threatened with or suffering from cardiovascular damage as a result of rheumatic fever. A previous report¹ presented data from the Children's Heart Hospital for the period June 1922 to January 1932. The present review is a study of the cases seen between June 1922 and June 1937.

People in the United States assumed an early role in the institutional care of children with heart disease and have established a number of institutions, among them the House of the Good Samaritan (Boston), the Irvington House on the Hudson (New York), Sunset Camp (Bartlett, Ill.), Ridge Farm (St. Louis) and the Children's Heart Hospital (Philadelphia). England, under a nationwide system, has made remarkable progress in developing resources for the care of children with heart disease in convalescent hospitals, and it was estimated in 1938² that there are 1.7 beds for each thousand elementary school children.

It has been stated that the ultimate results obtained through returning children from general hospitals to their homes or foster homes and the follow-up treatment through social service and visiting nurse departments of these hospitals are as satisfactory as the results following treatment in convalescent institutions. The final answer to this must be delayed until further data are accumulated. This report will present our results to March 1939, but since our children have not all been followed an equal number of years we are faced with the common problem of finding data with which a comparison can be made. We do feel that there are certain factors, evident at present, which justify the existence of care in a convalescent hospital:

1. Treatment varies with the individual case, but group control, under the instruction of a competent staff, provides that the medical care will be adequate and that the individual child's activity will be adjusted to the functional capacity of his heart. Such is the opinion

of Anderson and his co-workers³ at Cincinnati, who add that "of great assistance in establishing the new routine of living were the institutions such as the Children's Convalescent Home, the Condon School for Crippled Children and the County Chronic Disease Hospital."

2. Jones⁴ emphasizes that a specialized, competently trained physician is desirable in handling cases of rheumatic fever, the training being comparable to that of those working with cases of tuberculosis.

3. In a group, children cooperate better in the rest treatment for this condition, and with teachers as a part of the staff it is possible to carry them along with their classes during their long convalescence.

4. Silver⁵ studied a small group of patients under care at a residential school for cardiac children. Most children adapted themselves well emotionally and socially to their physical handicap. "The utilization of a residential school for cardiac children," he claims, "offers an opportunity for the establishment of a successful mental hygiene program and leads to the disappearance, in most of these children, of undesirable mechanisms established in the home."

5. Parents as well as the children are educated, through visiting periods, lectures and personal interviews, on the importance of rest, diet, hygiene, dangers of contact infections and the like.

6. A home environment which may be a definite handicap is eliminated. Paul and Salinger⁶ have noted the spread of rheumatic fever in families, and an infectious basis for the disease is suggested. Many times, too, parents have complained that with large families and inadequate finances they cannot alter their household routine to care adequately for their child.

7. Furthermore, such hospital groups offer valuable material for the instruction of medical students as well as graduate students interested in this type of work. Research into the value of newer methods of treatment and prevention of reactivations of rheumatic fever is assisted by a series that can better be controlled.

Miss Elizabeth Knowles, financed by the Philadelphia Heart Association, has made an intensive effort to get in touch with the 685 children who have received convalescent care at the Children's Heart Hospital from 1922 to 1937. This figure (685) does not include eighty-eight children who are excluded from the study because they stayed at the hospital less than one month or because they had congenital heart disease or were diagnosed as not having heart disease.

This work was done through the Robinette Foundation of the University of Pennsylvania and the M. W. Stroud Jr. Fellowship in Cardiology of the Pennsylvania Hospital.

1. Stroud, W. D.; Goldsmith, M. A.; Polk, D. S., and Thorp, F. Q.: Ten Years' Observation of Children with Rheumatic Heart Disease, *J. A. M. A.* 101: 502-506 (Aug. 12) 1933.

2. Schlesinger, Bernard: Milroy Lecture, *Lancet* 1: 649-654 (March 19) 1938.

3. Anderson, N. A.; Rauh, L. W., and Lyon, R. A.: Heart Disease in Children, *J. Med.* 20: 63 (April) 1939.

4. Jones, T. D.: Heart Disease in Children, *Am. J. Pub. Health* 28: 637-643 (May) 1938.

5. Silver, H. B.: The Emotional and Social Development of Girls with Heart Disease, *J. Pediat.* 12: 218-242 (Feb.) 1938.

6. Paul, J. R., and Salinger, Robert: Spread of Rheumatic Fever, *J. Clin. Investigation* 10: 33 (April) 1931.

In a report in 1930⁷ the requirements for admission to the Heart Hospital were given as follows:

1. Age limit: Boys, 3 to 12 years; girls, 3 to 13 years.
2. Children shall have either possible or potential cardiovascular disease.
3. No patients who have had congestive circulatory failure or with a hopeless prognosis shall be admitted.
4. Before admission each child shall spend at least two weeks in a hospital.
5. So far as possible all foci of infection should be removed.
6. Parents shall agree that children will remain in the hospital from three to six months or longer, at the physician's discretion.

The group of 685 children included 334 boys and 351 girls—a ratio influenced by the requirements for admission. We were unable to locate 105 (15.3 per cent) of the group, and an additional 144 children (21 per cent) have died.

RACIAL DISTRIBUTION

A tabulation of the group according to race is presented in table 1. Its significance is questioned, however, when one realizes that nearly one half of the patients are sent from hospitals and physicians in South Philadelphia, where the Italian and Jewish populations are most concentrated, and that certain races are more prompt than others to avail themselves of these institutional advantages.

From other reports we believe that there is an apparent resistance among Negroes to rheumatic fever. Thus Ash⁸ found that in the clinic of the Children's Hospital in Philadelphia, where the white and Negro children are about evenly divided, the rheumatic children were 83 per cent white and 17 per cent Negro. Sutton,⁹ at Bellevue Hospital in New York, found the percentage of Negroes in the cardiac clinic only one third of the percentage of Negroes in the general pediatric clinic. Wilson and her co-workers¹⁰ found that "only 4.6 per cent of the children were colored although the clinic draws from a colored district." This paper refers to the work of Wood, Jones and Kimbrough,¹¹ who found

TABLE 1.—Racial Distribution

Racial Group	Number	Per Cent
Total children.....	685	100.0
Amerienn.....	181	26.4
Italian.....	155	22.6
Jewish.....	109	15.9
Negro.....	27	3.9
Irish.....	25	3.7
Polish.....	13	1.9
All other nationalities.....	30	4.4
Nationality unknown.....	145	21.2

that rheumatic heart disease "seemed to be less common among the colored people than the white people in Virginia." In New York City⁹ there seems to be a susceptibility to rheumatic heart disease among the Italians, while the Jews are afflicted to a degree less than their general clinic percentage. The Irish apparently have a rather high tendency to rheumatism, although it is noted that the Irish in Ireland do not

have a high rate for heart disease. In Philadelphia, regardless of race, it was found that 0.91 per cent of public school children had organic heart disease.¹²

RHEUMATIC HEART DISEASE AND ABILITY TO WORK

Of the total group, 249 children (36.3 per cent) are attending school, and it is gratifying to find that 117 (17.1 per cent) are otherwise employed in spite of their cardiovascular handicap, while only thirty-nine

TABLE 2.—Children Discharged from the Children's Heart Hospital by Sex and Ability to Work: 1922-1937

Ability to Work at Time of Follow-Up	Both Sexes		Male		Female	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Total children.....	685	100.0	334	100.0	351	100.0
Attending school.....	249	36.3	132	39.5	117	33.3
Employed.....	117	17.1	42	12.6	75	21.3
Unemployed.....	39	5.7	23	6.9	16	4.6
In hospital.....	21	3.1	8	2.4	13	3.7
Deceased.....	10	1.5	4	1.2	6	1.7
No record (out of town).....	144	21.0	75	22.4	69	19.7
Unable to locate.....	38	5.5	22	6.6	16	4.6
Unable to locate.....	67	9.8	28	8.4	39	11.1

* Includes one girl unable to work because of tuberculosis.

† Includes two boys and one girl hospitalized for illnesses other than heart disease.

‡ Seven of these were located but incomplete information was obtained.

(5.7 per cent) who are able to work are unemployed. Table 2 presents a record of the children discharged from the hospital by sex and by ability to work, while table 3 records the ages to March 1, 1939, and the ability to work.

From the results it would be difficult to state that sex had any influence on the ultimate prognosis. This is in agreement with the general observations of Schlesinger^{12a} and with the experience at the Children's Hospital of Philadelphia,⁸ where the death rate for the sexes was similar to that of the group as a whole. There seems to be general agreement that infection with rheumatic fever is slightly more prevalent among females than among males.¹² The ability for activity as noted in table 3 among those living shows a tendency to decrease with the older age groups (82 per cent of those under 15 years and 67.4 per cent of those over age 15).

In evaluating the ability to work in relationship to the length of stay at the Heart Hospital, it should be noted that only the first admission is counted; the days following a period in a general hospital, where a patient may have been sent for an acute episode, are added to the days of hospitalization at the Heart Hospital, and the total stay is counted as one admission. The largest group of children (36.5 per cent) stayed from three to five months, and the next largest group (30.4 per cent) from six to eight months. In table 4 it is seen that of the 110 children who stayed less than three months a large number (41 per cent) are dead, and it may be assumed that this percentage would be increased if the fate of the remaining nineteen children were known. Many of this group of children were probably not fair selections for convalescent hospital care, for after a short stay they had to be returned to general hospitals because of advanced illness. Many

7. Stroud, W. D.: The Treatment of Rheumatic Cardiovascular Disease in Children, *M. Clin. North America* 13: 845-856 (Jan.) 1930.

8. Ash, Rachel: The Prognosis of Rheumatic Infection in Childhood, *Am. J. Dis. Child.* 52: 250-295 (Aug.) 1936.

9. Sutton, L. P.: Observations on Certain Etiological Factors in Rheumatism, *Am. Heart J.* 4: 145-152 (Dec.) 1928.

10. Wilson, May G.; Lingg, Claire, and Croxford, Geneva: Statistical Studies Bearing on Problems in the Classification of Heart Disease: III. Heart Disease in Children, *Am. Heart J.* 4: 164-196 (Dec.) 1928.

11. Wood, J. E., Jr.; Jones, T. D., and Kimbrough, R. D.: The Etiology of Heart Disease, *Am. J. M. Sc.* 172: 185 (Aug.) 1926.

12. Cahan, J. M.: Incidence of Heart Disease in School Children, *J. A. M. A.* 92: 1576-1579 (May 11) 1929.

12a. Schlesinger, Bernard: The Public Health Aspect of Heart Disease in Children, *Milroy Lecture, Lancet* 1: 593-599 (March 12) 1932.

13. Anderson, Rauh and Lyon, S. Ash, Sutton, Wilson, Li-ss and Croxford.¹²

of the fatal cases were admitted during the first few years of the institution before a suitable basis for selection of cases was found.

Considering the groups able to carry on reasonably normal activity (in school, working, imemployed), it

As seen in table 5, the functional classification¹⁴ at the time of discharge supports this contention. It can be seen that 33.2 per cent of those who were hospitalized for from three to five months had symptoms at discharge (i. e. classes II A, II B, III). Similarly, 50.5

TABLE 3.—Children Classified by Age and by Ability to Work at the Time of Follow-Up

Age at Time of Follow-Up*													
Ability to Work at Time of Follow-Up	Total Child- ren	Under 10 Yr.		10-14 Yr.		15-19 Yr.		20-24 Yr.		25 Yr. and Over		Deceased	
		Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
Total children.....	685	11	100.0	146	100.0	220	100.0	127	100.0	37	100.0	144	100.0
Attending school.....	249	9	81.8	120	82.2	113	51.4	7	5.5	..	..	..	..
Working.....	117	..	..	..	..	35	15.9	61	48.0	21	56.8	..	..
Unemployed.....	39	..	..	..	..	25	11.4	12	9.5	2	5.4	..	..
Unable to work.....	21	..	..	5	3.4	10	4.5	5	3.9	1	2.7	..	..
In hospital.....	10	1	9.1	3	2.1	6	2.7	..	..	..	..	144	100.0
Deceased.....	144	..	..	..	..	..	..	..	..	..	..	..	..
No record (out of town).....	38	1	9.1	7	4.8	15	6.8	11	8.7	4	10.8	..	..
Unable to locate.....	67	..	..	11	7.5	16	7.3	31	24.4	9	24.3	..	..

* Age as of March 1, 1939.
† Includes one girl handicapped by tuberculosis.
‡ Includes two boys and one girl hospitalized for illnesses other than heart disease.
§ Seven of these were located but incomplete information was obtained.

TABLE 4.—Children Classified by Length of Stay at Children's Heart Hospital and Ability to Work at Time of Follow-Up

Length of Stay at Children's Heart Hospital											
Ability to Work at Time of Follow-Up	Total Children	1-2 Months		3-5 Months		6-8 Months		9-11 Months		12 Months and Over	
		Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Total children.....	685	110	100.0	250	100.0	208	100.0	80	100.0	37	100.0
Attending school.....	249	16	14.5	84	33.6	89	42.8	41	51.3	19	51.4
Working.....	117	19	17.3	58	23.2	30	14.4	9	11.3	1	2.7
	39	8	7.3	12	4.8	14	6.7	3	3.7	2	5.4
	21	3	2.7	7	2.8	6	2.9	3	3.7	2	5.4
In hospital.....	10	..	..	3	1.2	3	1.5	2	2.5	2	5.4
Deceased.....	144	45	40.9	43	17.2	35	16.8	14	17.5	7	18.9
No record.....	105	19	17.3	43	17.2	31	14.9	8	10.0	4	10.8

* Includes one girl handicapped by tuberculosis.
† Includes three children hospitalized for illnesses other than heart disease.

TABLE 5.—Length of Stay at the Children's Heart Hospital Compared with Functional Classification on Discharge

Length of Stay at Children's Heart Hospital	Total Children		Functional Classification on Discharge												Not Classified	
			Class I		Class II A		Class II B		Class III		Class E		Class F			
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Total children....	685	100.0	152	22.1	192	28.0	68	9.9	59	8.6	38	5.5	98	14.3	78	11.4
1-2 mo.....	110	16.0	19	17.2	19	17.2	14	12.7	26	23.6	6	5.5	10	9.1	16	14.5
3-5 mo.....	250	36.5	63	25.2	45	18.0	25	10.0	13	5.2	24	9.6	46	18.4	34	13.6
6-8 mo.....	208	30.4	52	25.0	77	37.0	15	7.2	13	6.3	6	2.9	24	11.5	21	10.0
9-11 mo.....	80	11.7	13	16.2	31	38.7	10	12.5	3	3.8	1	1.5	15	18.8	7	8.8
12 mo. and over...	37	5.4	5	13.5	20	54.1	4	10.8	4	10.8	1	2.7	3	8.1	..	...

TABLE 6.—Relation Between Present Ability to Work and Functional Classification on Discharge from the Children's Heart Hospital

Ability to Work at Time of Follow-Up	Total Children	Functional Classification on Discharge						Not Classified
		Class I	Class II A	Class II B	Class III	Class E	Class F	
Total children.....	685	152	192	68	59	38	98	78
Attending school.....	249	75	58	10	1	13	61	1
Working.....	117	50	26	7	4	11	11	28
Unemployed.....	39	11	12	5	3	3	4	1
In hospital.....	21	5	8	3	..	..	2	3
Deceased.....	10	2	4	2	..	..	2	..
No record.....	144	9	55	28	49	3	1	19
	105	20	19	13	2	8	17	26

* Includes one girl handicapped by tuberculosis.
† Includes three children hospitalized for illnesses other than heart disease.

does not appear that a prolonged stay at the hospital has materially increased the number who are active, nor has the death rate been reduced (excluding those who remained from one to two months). Yet those staying longest were usually hospitalized in relationship to the duration of their rheumatic activity (mainly determined by the sedimentation rate of the blood) during their period of observation.

per cent of the children who remained in the hospital from six to eight months had symptoms at discharge; in the nine to eleven month group 55 per cent and in the group staying longer than a year 75.7 per cent. As has already been noted, many of those remaining

14. Criteria for the Classification and Diagnosis of Heart Disease, New York Tuberculosis and Health Association, New York, Sixth Printing of Third Edition, 1938 (Copyright 1932).

less than three months were discharged to general hospitals, and in this group 53.6 per cent were discharged with symptoms.

To follow further the functional classification at the time of discharge from the hospital, it is interesting to see how this factor has ultimately influenced the ability

TABLE 7.—Children Classified by Year of Discharge and Medical Supervision at Time of Follow-Up

Year of Discharge	Total Children	Present Medical Supervision					No Record	
		Clinic	Private Physician	In Hospital	No Medical Care	Deceased	Out of Town	Unable to Locate
Total	685	192	104	10	132	144	38	62
1937	25	15	6	1	1	1	1	..
1936	34	13	7	3	3	6	2	..
1935	30	16	10	1	2	..	..	1
1934	52	28	5	2	7	8	..	2
1933	66	29	12	1	14	3	3	3
1932	86	25	16	1	21	13	4	6
1931	58	15	10	..	15	12	3	2
1930	52	13	7	..	7	8	10	6
1929	43	15	10	1	10	5	1	1
1928	37	5	2	..	11	13	..	6
1927	29	6	3	..	7	7	3	3
1926	43	5	5	..	5	18	4	6
1925	31	3	2	..	8	10	4	4
1924	40	3	3	..	7	14	1	12
1923	44	1	6	..	12	17	1	7
1922	15	..	..	..	2	9	1	8

of these children to carry on an active useful existence (table 6). Of the total number 59.1 per cent are able to go to school, are working or are able to work. For the subgroups the percentages are class I 76.3 per cent, class II A 65.6 per cent, class II B 32.3 per cent, class III 13.5 per cent, class E 71.1 per cent and class F 77.5 per cent. This summary supports our natural

TABLE 8.—Deceased Patients Classified by Cause of Death and Age at Death

Age at Death	Total Children	Cause of Death					
		Con- gestive Heart Failure	Acute Rheu- matic Infection	Infec- tious Endo- carditis	Sudden Death	Pneu- monia	Non- cardiac Deaths
All ages	144	104	11	9	9	5	6
5 years	2	2	..	..	..	..	..
6 years	4	1	1	..	..	..	1
7 years	5	5	..	..	..	..	..
8 years	12	9	2	..	1	1	..
9 years	5	2	2	..	1	..	..
10 years	11	8	..	1	1	1	..
11 years	16	14	1	..	..	1	1
12 years	20	16	2	..	1	1	..
13 years	21	18	1	1	..	1	..
14 years	10	8	1	1	..	..	1
15 years	10	6	..	2	1	..	1
16 years	7	4	1	..	..	..	2
17 years	5	5	..	..	1	..	..
18 years	2	1	..	..	1	..	..
19 years	3	1	..	1	..	..	1
20 years	2	1	..	..	1	..	..
21 years	3	2	..	..	1	..	..
22 years	2	..	..	1	1	..	..
23 years	..	..	..	..	..	1	..
24 years	1	..	..	..	..	..	..
25 years	..	..	..	1	..	..	..
26 years	1	..	..	..	..	..	..
27 years	..	..	..	..	..	..	..
28 years	1	1	..	..	..	..	..

assumption that, as a group, an early estimation of the functional capacity is an index to the prognosis.

Table 6 might serve to call attention to the importance of rehabilitation and placement in industry of those handicapped with cardiovascular disease.¹⁵ "It seems questionable whether physical effort is responsible for the production of cardiovascular disease or

plays as large a part in the progression of cardiovascular disease as has been previously believed. If this is true the training of cardiac patients and their placement in industry constitutes as great a responsibility for the physician as any other form of therapeutics—in fact in class I and II A a much more important responsibility than medication or other forms of therapy."

MORTALITY

Of our total number of children, 144 (21 per cent) have died. Another 15 per cent are either out of town or could not be located. Since we have felt that during the first few years of the institution the wrong type of case was accepted by the hospital and that the follow-up in these cases was inadequate, we are not surprised to find that the mortality rate for the first four and a half year period is unnecessarily high (table 7).

Thus eliminating the years 1922 through 1926 and determining the loss of life among our discharges from

TABLE 9.—Deceased Patients Classified by Age at Primary Rheumatic Manifestation and Time Elapsing Before Death

Age at Primary Manifestation	Total Children	Duration of Time Elapsing Between First Manifestation and Death						
		Less Than 1 Yr.	1-2 Yr.	3-5 Yr.	6-8 Yr.	9-11 Yr.	12 Yr. and Over	Un- known*
All ages.....	144	8	20	41	22	15	8	30
3 years.....	13	..	..	5	1	5	1	1
4 years.....	9	..	1	3	3	1	1	..
5 years.....	18	1	1	2	10	3	..	1
6 years.....	17	1	4	8	3	..	1	..
7 years.....	20	1	5	8	1	3	2	..
8 years.....	10	2	1	7	..	..	..	..
9 years.....	11	2	2	3	2	2	..	..
10 years.....	9	..	4	2	..	1	2	..
11 years.....	5	..	1	2	1	..	1	..
12 years.....	4	1	1	1	1	..	..	..
13 years.....	1	..	..	..	..	..	..	1
No history†.....	13	..	..	..	..	..	..	13
No record.....	14	..	..	..	..	..	..	14

* Includes the six children whose deaths were due to causes other than heart disease.

† No history of rheumatic fever, chorea or carditis could be obtained.

‡ Age at primary manifestation unknown, or record of rheumatic history previous to admission not available.

1927 to 1937, we find a mortality of 14.8 per cent, or seventy-six deaths. Of this modified group only twenty-seven children (5.3 per cent) are out of town and thirty (5.9 per cent) have not been located. According to a report from the House of the Good Samaritan in Boston,⁴ 24.2 per cent of their 1,000 patients, with an average follow-up of ten years, are dead. In a ten year follow-up of 1,000 patients at the County Convalescent Heart Hospital for Children at West Wickham, England,¹⁶ for patients with acquired heart disease, there was a mortality of 12.3 per cent—an excellent record with only an additional 6 per cent of patients in poor health. In the first ten years (1920-1930) of the Irvington House¹⁷ 24 per cent of the patients had died at the time of the report. Coombs,¹⁸ reporting on 253 patients with cardiac infection in Bristol, England, showed that 21.4 per cent had died within ten years after the primary manifestation of rheumatic fever. This percentage is identical with that previously reported from the Children's Heart Hospital in the ten year study.¹ In a group of 395 patients

16. Schlesinger (footnotes 2 and 19).

17. Halsey, R. H.: Irvington House; The First Ten Years—An Analysis of the Mortality Records, 1920-1930, printed in pamphlet form January 1938.

18. Coombs, C. F.: Rheumatic Heart Disease, New York, William Wood & Co., 1924.

15. Stroud, W. D.: The Rehabilitation and Placement in Industry of Those Handicapped with Cardiovascular Disease, J. A. M. A. 105: 1401 (Nov. 2) 1935.

without institutional convalescent care reported on by Wilson, Lingg and Croxford,¹⁰ only 11.9 per cent had died in ten years.

A special study of the deceased patients was made in connection with this report. The cause of death was sought for each one of the 144 fatalities. A satisfactory report was obtained on all but two; in one of these death was said to be due to acute bronchitis and in the other case to "grip with complications." We assume that these were noncardiac deaths and they are so listed in table 8. This table reveals that congestive heart failure claims the largest group (104 patients); eleven apparently died of acute rheumatic infection without signs of decompensation, nine died of bacterial endocarditis (three acute and six subacute), nine died suddenly (one from a pulmonary infarct, five from

(Cincinnati),³ 7.3 years—with one half of initial infections occurring between the ages from 6 to 9 years (New York),¹⁰ 7 years (New Haven),¹⁹ 10.2 years (England),¹⁸ 7 years (England),²⁰ 6.8 years (Philadelphia);⁸ at the Irvington House (New York)¹⁷ the mean age is 8 years, while more were infected at age 7 than at any other single age. Fifty-three per cent of our children who died had their first rheumatic attack at 7 years or earlier and 28 per cent had their first attack from 8 to 13 years of age, while the records do not give the information for the remaining 19 per cent for reasons cited in table 9.

The greatest mortality occurred between three to five years after the primary manifestation of rheumatic fever. Nineteen per cent of the 144 children lived less than three years and 48 per cent less than six years.

TABLE 10.—Experience in Pregnancy of Girls Discharged from the Children's Heart Hospital

Number of Pregnancies	Course of Pregnancy									
	Total Married Girls	Total Pregnancies	No Complications	Miscarriage	Therapeutic Abortion	Rheumatic Activity		Signs of Decompensation		Other Complications
						During Pregnancy	After Delivery	During Pregnancy	After Delivery	
Total girls.....	40	47	32	4	1	4	1	2	1	2
Married, never pregnant.....	13	..	..	..	..	..	..	..	..	..
One pregnancy *.....	14	13	9†	1	..	1	1	1	..	1
Two pregnancies †.....	7	14	8	2	..	2	..	..	1	1
Three pregnancies.....	5	15	11§	1	1#	1	..	1	..	..
Four pregnancies.....	1	4	4	..	..	..	..	..	..	..

* Three patients included who have not yet been delivered.
† Two cases of twins included.
‡ Includes three cesarean deliveries and two sterilization operations.

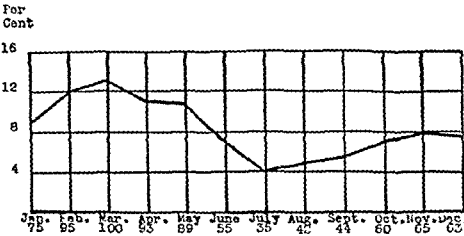
§ Includes one patient pregnant now for the third time.
Also sterilized.

embolism and three from causes not definitely stated), five died of pneumonia and six died of noncardiac causes. Information obtained concerning the presence of auricular fibrillation in the fatal cases is rather meager. Two of the cases of sudden death were accompanied by auricular fibrillation (age of onset unknown), while in three there was no fibrillation, and for the remaining four this information was not learned. Among those who died of congestive heart failure, auricular fibrillation was present in thirteen and absent in nineteen and there was no record for the remaining seventy-two. Five patients had auricular fibrillation starting shortly before death; four had had fibrillations for some time—one for as long as five years. The ages of onset of auricular fibrillation were one at 7 years, one at 8 years, one at 11 years, three at 13 years, one at 16 years, one at 19 years and one at 23 years.

The youngest patient to die was 5 years old and the oldest 28 years. Eighty-one per cent of deaths occurred before the age of 16, with the heaviest grouping between ages 8 to 16. This may be significant for the surviving children, since 75 per cent of them are now over 16 years of age. It appears that the children who live through the adolescent period have a good chance of reaching maturity. Wilson and her associates¹⁰ note that at the age of about 12 years the tendency to acute infection begins to diminish. Schlesinger^{12a} stresses his conviction that puberty is the determining period at which the power of resistance to rheumatic infection increases, cutting down on the number of recurrences. One of our patients died of active rheumatic fever at 16 years of age but none at an older age.

There is uniformity of opinion as to the age at which rheumatic fever usually begins its course. In our group the largest number of first attacks occurred at the age of 7 years. From other studies the average ages at onset are 8 years (Boston) * from 7 to 8 years

When the thirty cases are eliminated in which the duration of the disease is unknown, the percentage of patients living less than six years becomes 61. Eight children lived longer than twelve years, the oldest surviving twenty-one years after her initial attack at 7 years. There is no apparent indication in table 9 that the children in whom rheumatic fever occurred early in childhood have a shorter span of life than those in whom the onset of the disease came later. If the patients are divided into two subgroups, one with onset ages of 3 through 7 years and the other with onset



Seasonal prevalence of primary manifestations and reactivations of rheumatic fever. Three hundred and seventy-seven (46 per cent) of 816 primary infections and reactivations occurred between February and May.

ages of 8 through 12 years, those in the latter subgroup have the higher percentage mortality during the first six years of the disease. Wilson and her associates¹⁰ likewise found no apparent relationship between mortality and the duration of the disease. However, at the Children's Hospital in Philadelphia⁸ "there was a distinct drop in the death rate among the older children who were first taken ill between 9 and 11 years of age." Halsey,¹⁷ studying 203 children under insti-

19. Paul, J. R.: Age Susceptibility to Familial Infection in Rheumatic Fever. *J. Clin. Investigation* 10: 53-60 (April) 1931.

20. Poynton, F. J.: Observations on the Nature and Symptoms of Cardiac Infection in Childhood. *Brit. M. J.* 1: 249 (March 2) 1918.

tutional care, for whom an estimation of the duration after the onset of the disease to death could be determined found that approximately 16.2 per cent died in the fourth year of the disease; 25 per cent of deaths occurred within the first six years, and in two thirds the duration was less than eight years. Only one fifth of his patients survived ten years or more. Ash⁸ reports that, of ninety-three deceased children with clinic care, one third of the deaths occurred within the first year, 51 per cent within two years and 74 per cent within five years of the onset.

SEASONAL INCIDENCE

The dates of onset of 816 attacks of rheumatic fever, chorea and acute carditis were learned, and the accompanying chart shows that the largest number of attacks occurred in March, with a high incidence as well in February, April and May. Forty-six per cent of the 816 attacks occurred in these four months. The lowest number of attacks was in July, August and September.

It is of interest to know the seasonal incidence for one's locality and compare it with other reports. Coombs¹⁸ found a maximum incidence in England during the months of December and January. In a report from two hospitals in London and one in Glasgow,²¹ the highest incidence is in the three months November, December and January, with the lowest incidence in the summer months. Sutton⁹ reports that the peak in New York is reached in April, with the low incidence during October.

PREGNANCY

An attempt has been made to determine the effect of marriage and childbirth on the girls in this series (table 10). Of all those living whom we have been able to follow up, thirty-eight of the girls are married and two have had illegitimate children (one at 15 and one at 17 years). Thirteen of these forty girls have never been pregnant, but among the remaining twenty-seven there is a record of forty-seven pregnancies. None of those who are known to have died were married. Only one girl suffered definite congestive failure at delivery, and she has been sterilized. Two others showed slight symptoms of congestive failure during pregnancy but went through delivery successfully. "Other complications" include one case of hypertension with threatened abortion and one of severe hemorrhage at the time of the first menstrual period after delivery.

SUMMARY

1. Six hundred and eighty-five children threatened with or suffering from rheumatic heart disease who have been treated at the Children's Heart Hospital of Philadelphia, between 1922 and 1937, have been studied.

2. It is believed that available educational facilities, attention to hygiene, adequate medical supervision and ability to adjust the child physically and emotionally to his handicaps are factors to justify such convalescent institutional care, and further that opportunities for research and training are made available.

3. An apparent resistance among Negroes to rheumatic fever was noted but otherwise the evidence regarding the relationship of race to rheumatic fever did not appear to be significant.

4. Among twenty-seven girls who became pregnant, only one suffered definite congestive failure at delivery.

1011 Clinton Street.

21. Child Life Investigations: Social Conditions and Acute Rheumatism. Medical Research Council, London, 1927.

STOMACH LAVAGE IN THE DIAGNOSIS AND CONTROL OF TREATMENT OF TUBERCULOSIS

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Meunier¹ in 1898 was the first to employ gastric lavage as a means of establishing the diagnosis of tuberculosis in infants and children. Although both his idea and his results were good, his work was almost forgotten until 1927, when Armand-Delille² and Vibert revived it. Since then Poulsen, Jensen and Husted³ and again Poulsen,⁴ Wallgren,⁵ Boer,⁶ Kereszturi and her co-workers,⁷ Sayé and his co-workers,⁸ Collis,⁹ Gourley¹⁰ and many others have used the method with very favorable results.

At first this method was used only on infants and children, as originally described by Meunier.¹ Clausen¹¹ has the distinction of being the first to report results on adults. As time went on the value of the method became more evident, and its usefulness has been established for diagnosis and for control of treatment not only of children but also of adults. Among others, Ulmar and Ornstein,¹² Gad,¹³ Levin,¹⁴ Bobroy,¹⁵ Stiehm,¹⁶ Boide and Simonin¹⁷ and Gullbring and Levin¹⁸ have reported work on adults.

At the Chicago Municipal Tuberculosis Sanitarium we have been doing stomach lavages on our adult patients whose sputum was negative for tubercle bacilli since February 1934. A preliminary report of this

From the Research Laboratories of the City of Chicago Municipal Tuberculosis Sanitarium.

1. Meunier, H.: *Bacilloscopie des crachats extraits de l'estomac pour le diagnostic de la tuberculose pulmonaire de l'enfant*, Presse méd. 2: 81. 1898.

2. Armand-Delille, P. F.: *Bacteriologic Diagnosis by Examination of the Stomach Contents*, Am. J. Dis. Child. 34: 547 (Oct.) 1927.

3. Poulsen, Valdemar; Jensen, K. A., and Husted, E.: *The Demonstration of Tubercle Bacilli in Small Children with Pulmonary Tuberculosis*, Am. J. Dis. Child. 37: 900 (May) 1929.

4. Poulsen, Valdemar: *Demonstrations of Tubercle Bacilli in Gastric Lavage*, Am. J. Dis. Child. 42: 783 (April) 1931.

5. Wallgren, Arvid: *Tubercle Bacilli in Childhood Erythema Nodosum Demonstrated by Gastric Lavage*, Am. J. Dis. Child. 41: 816 (April) 1931.

6. Boer, H. D.: *Tuberculosis in Children Due to Infection with Bovine Bacilli*, Maandschr. v. kindergeneesk. 2: 337 (April) 1933.

7. Kereszturi, Camille; Mishulow, Lucy; Schick, Béla, and Behner, Dorothy: *Tubercle Bacilli in the Stomach Contents of Children with Positive Tuberculin Tests*, J. A. M. A. 98: 1879 (May 28) 1932.

8. Sayé, L.; Shelton, R., and Doménech Alsina, J.: *Sur le diagnostic bactériologique de la tuberculose infantile par l'inoculation du contenu gastrique au cobaye*, Bull. Acad. de méd., Paris 109: 837 (June 20) 1933.

9. Collis, W. R. F., and Brockington, C. F.: *Tuberculosis in Childhood: Its Etiology and Prognosis as Shown by Stomach Lavage Method of Obtaining Tubercle Bacilli*, Lancet 1: 127 (Jan. 21) 1933.

10. Gourley, Ina: *Tubercle Bacilli in the Gastric Contents of Tuberculous Children*, Am. Rev. Tuberc. 29: 461 (April) 1934.

11. Clausen, Vilhelm: *Ueber die Bedeutung der Magenspülwasseruntersuchung für die Diagnostik der Lungentuberkulose*, Acta tuberc. Scandinav. 5: 379, 1931.

12. Ulmar, David, and Ornstein, G. G.: *Gastric Examination in Pulmonary Tuberculosis with Negative Sputum: Diagnostic Importance*, J. A. M. A. 101: 835 (Sept. 9) 1933.

13. Gad, Ulf: *Diagnostic Value of Gastric Lavage in Adult Patients Without Roentgenographic Foci in Lungs*, Acta tuberc. Scandinav. 11: 189, 1937.

14. Levin, Nils: *On Demonstration of Tubercle Bacilli by Means of Lavage of Stomach in Different Forms of Tuberculosis in Children*, Acta paediat. 17: 160, 1935 (Supp. 1).

15. Bobroy, N. N.: *Diagnostic Value of Armand-Delille Method (Demonstration of Tubercle Bacilli in Stomach Washings)*, Proh. tuberc. 1936, p. 718.

16. Stiehm, R. H.: *Tubercle Bacilli in the Gastric Contents: An Important Diagnostic and Prognostic Finding*, Am. J. M. Sc. 191: 346 (Sept.) 1937.

17. Boide and Simonin: *L'examen bactériologique du liquide de lavage gastrique dans le diagnostic de la tuberculose pulmonaire*, Soc. de méd. mil. franc., Bul. mens. 31: 331-335 (June) 1937.

18. Gullbring, Alf, and Levin, Nils: *Importance of Gastric Lavage for Demonstration of Tubercle Bacilli in Adults (with Pulmonary Tuberculosis)*, Acta med. Scandinav. 92: 169, 1937.

work was made in 1935¹⁹ and 1937.²⁰ At present we present a series of 1,000 patients of whom 970 (97 per cent) were over 10 years of age. This is shown in table 1 and in the chart. This group of patients with negative sputum represents about 11 per cent of the total admissions to the Municipal Sanitarium from February 1934 to October 1938.

PROCEDURE

The patients arise in the morning but are not allowed any food or liquids. Before aspiration they are given 4 ounces (120 cc.) of sterile distilled water to drink. Immediately after the patients have swallowed the water a regular Ewald tube is passed and the contents of the stomach are aspirated, the whole procedure taking from fifteen to twenty seconds.

At first we used ordinary tap water, but this was criticized on the grounds that acid-fast bacilli may be found in tap water. Although we have never found a false positive result, nevertheless we now use boiled distilled water. Another factor that was thought might cause a false positive result was that the Ewald tubes and bulbs might not have been cleaned properly. We checked this by washing all the cleaned tubes and bulbs with sterile distilled water and treating the sediment as is usually done in a routine way. The results of this procedure showed an absence of any acid-fast bacilli on culture or on guinea pig inoculation. The method of sterilization of the bulbs and tubes is as follows: They are washed with hot water and then with tincture of green soap. Then they are immersed in 20 per cent saponated solution of cresol for forty-five minutes, after which the bulbs and tubes are washed again with hot water and dried. The basins are treated in the same way. We conclude, therefore, that after the tubes and bulbs are properly washed and sterilized they are free from any tubercle bacilli.

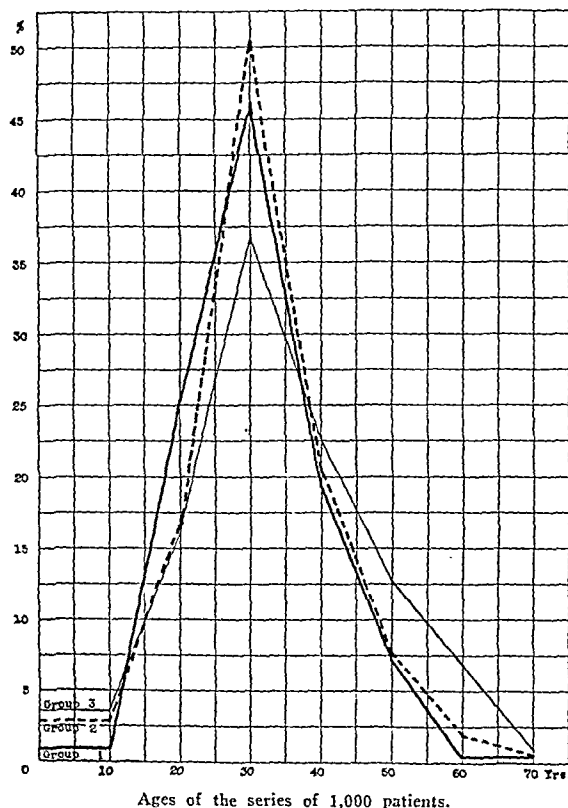
One of us (S. J. C.) has developed a special technic for passing the Ewald tube. The method is as follows: Insert a cold wet Ewald tube about 1½ inches (4 cm.) into the center of the patient's mouth. At the same time the patient is told to bite the tube lightly with his teeth and to breathe deeply through the mouth. The patient's head is flexed sharply so that his chin rests on his chest. The operator's left hand is placed around the posterior part of the patient's neck, applying a downward pressure. The position of the arm serves two purposes; first, it keeps the patient's head flexed on the chest; second, it acts as a vise and keeps the patient under control. The patient is told to release his bite on the tube, and as he does so the operator gradually and steadily passes the tube down with his right hand. The bulb is connected, and when fluid appears in the glass section of the tube it is immediately withdrawn. The whole procedure should not take more than fifteen to twenty seconds. By this method, 2 ounces (60 cc.) of the 4 ounces ingested can be aspirated.

The aspirated contents are placed in sterile bottles, sent to the bacteriologic laboratory and worked up as soon as possible. Here the contents are centrifuged in 100 cc. tubes for forty-five minutes at a speed of 2,500 revolutions a minute. In most cases the sediment was rather scant and all, or the greater part of it, was used for animal inoculation. When there was enough sediment, part of it was treated with acid or alkali and cultured on cream and Lowenstein-Jensen medium.

19. Stadnichenko, A. M. S., and Cohen, S. J.: Read before the Mississippi Valley Medical Society in 1935.

20. Stadnichenko, A. M. S., and Cohen, S. J.: Gastric Lavage as a Means of Demonstrating Tubercle Bacilli in Pulmonary Tuberculosis, *Nat. Tuberc. A. Tr.* 33: 125, 1937.

Since this work was more or less experimental and since there was doubt whether the acid-fast bacilli were tubercle bacilli, animal inoculations were made in all the thousand cases, regardless of the results with the smears. In the beginning of our work we used treated specimens for animal inoculation, but we observed in a few instances that while specimens showed typical acid-fast bacilli on the smears they failed to produce tuberculosis in animals. Repeated inoculations, however, with untreated specimens from the same patient gave positive results. This led us to the belief that some of the bacilli might be killed by treatment; therefore almost all the animals in this series were inoculated with untreated specimens. The mortality due to secondary infections among the guinea pigs inoculated with untreated specimens was less than 1 per cent, and most



of the deaths occurred in the summer, when the mortality in guinea pigs is always higher.

Several investigators have questioned the use of untreated sediment of stomach lavage. They state that most of their guinea pigs die of secondary infections. In checking our procedure we find that we inoculated the guinea pigs as soon as possible, usually within two hours after the stomach was aspirated. This short interval does not allow enough time for the growth of other types of bacteria. If more time is required, it is recommended that the specimen be kept in the ice box until it can be worked up.

Another important factor in preventing secondary infections and spontaneous tuberculosis in guinea pigs is to begin with healthy stock and to give good care after the animal is inoculated. This requires a skilled caretaker and a hygienic breeding house and animal hospital.

The guinea pigs were usually killed at the end of two months. Very few of these animals, even with extensive tuberculosis, died before this time. Smears

and cultures were made from the inguinal lymph nodes or spleen, or from both. The diagnosis of tuberculosis was never made on gross pathologic study alone—the acid-fast bacilli were always found on the smears before the animal was pronounced positive for the organisms.

This series of 1,000 cases might be divided into two main groups (excluding positive controls): a group in which tubercle bacilli were never found by routine examination and the stomach lavages were done to help establish the diagnosis, and a group used to guide therapy and to study its effect.

Most of the patients in this series (excluding controls with negative results) had rather scanty sputum, and that perhaps is one of the main reasons why it was difficult to find the sputum positive by direct or concentration examinations.

Poulsen and Anderson²¹ have shown that the percentage of positive results increases with the number of the repeated lavages. In their series of 199 tuberculous children (from 6 to 10 years of age) they obtained positive results with 152, or 77 per cent, on the first washing; but when the procedure was repeated three times the number of positive results increased to 193

TABLE 1.—The Whole Series of One Thousand Cases Arranged According to Age in Decades

Age, Yr.	Group 1		Group 2		Group 3	Positive Control	Negative Control
	A	B	A	B			
0-10.....	4	0	2	5	9	2	8
10-12.....	53	10	20	22	43	12	33
20-30.....	101	14	45	83	97	35	65
30-40.....	39	8	21	30	59	8	29
40-50.....	14	4	4	15	33	3	30
50-60.....	1	0	2	3	18	0	8
60-70.....	1	0	0	1	2	0	3
70-80.....	0	0	0	0	1	0	0
Total number.....	213	36	94	159	262	60	176
Positive smears.....	66	18	41	0	0	36	0
No. of cases with collapse therapy.....	50	12	53	110	79	21	0
No. of deaths.....	12	8	6	4	3	8	17

(96 per cent), and after five washings they obtained 100 per cent positive results. Similar observations were made by Gullbring and Levin¹⁸ on their series of 348 adult patients, although the exact figures were not given.

The majority of the patients in our series had only one stomach lavage. Of 1,000 subjects 120 had two lavages and twenty had three. Of these 140 subjects, eight yielded positive results on the second lavage but not on the first, and two on the third and not on the first two. This increases the positive results by 7.3 per cent on repetition. In all our cases, however, from a few to many months had elapsed between the repeated lavages, so there is the possibility of a change in the condition of these particular patients.

We have divided the 1,000 patients into three main groups, with two subgroups and also positive and negative controls. The composite data of all patients are shown in tables 2 and 3.

GROUP 1

Group 1 comprised 249 patients. They had evidences of tuberculosis by x-ray or clinical study or by both. The results of sputum examination were always negative, but the results of stomach lavage were positive. Of these 249 patients, thirty-six became positive for bacilli on sputum examination later, necessitating the division of the group into two subgroups, A and B.

Group 1 A was composed of 213 patients who were always negative for bacilli on routine sputum examination and remained negative but who by stomach lavage were found positive. Of these 213 subjects sixty-six (31 per cent) were found positive by smears; 211 were positive on guinea pig inoculations, while two were positive by stomach lavage culture but not by the guinea pig inoculation. These two cultures when inoculated into the guinea pigs proved to be virulent. Of the 211 patients who produced tuberculosis in guinea pigs, there was one with far advanced type B involvement whose direct smear of the stomach washing showed at least 10 acid-fast bacilli per field, yet the guinea pig showed only enlargement of the inguinal lymph nodes. The repeated stomach lavage in this case produced the same result, and even when a pure culture of the bacilli was injected into a guinea pig the only pathologic change observed was the enlargement of the inguinal lymph node. This was the only bacillary strain of low virulence encountered in the series.

There were three patients in this group who were absolutely insensitive to the Mantoux test. One patient had miliary tuberculosis, dying two days after leaving the Municipal Sanitarium. The condition of two other patients was diagnosed as far advanced tuberculosis. One was absolutely insensitive to the Mantoux test at the time the stomach washing was found positive, but the patient later had a strongly positive Mantoux reaction. The third patient was found positive for bacilli three different times on stomach lavage. The patient is having pneumothorax therapy, is feeling well, but is still absolutely insensitive to the Mantoux test. This involvement might belong to the Besnier-Boeck-Schaumann type. Only fifty-nine patients of this group were receiving collapse therapy.

There were twelve deaths (5.6 per cent) in this group, with three postmortem examinations.

As already mentioned, sixty-six patients in this group had positive smears yet their sputums were never found positive. Some of the smears of the stomach washings were very strongly positive, and it is rather difficult to explain why a patient having over eighty negative sputums should have 25 bacilli per field on stomach lavage. In some cases this may be explained on the basis of bronchial peristalsis which caused the bronchial secretions to go into the stomach without coughing, as suggested by Ulmar and Ornstein.¹² Most of these patients, when questioned, state that they either have no cough or raise practically nothing. The majority of sputum specimens in group 1 are nothing more than saliva. It is known that the introduction of pneumothorax therapy usually stops the cough and diminishes the expectoration. It is for these two groups of patients, therefore—those who do not cough and those receiving pneumothorax therapy—that stomach lavage is of greatest value, first in the diagnosis and second in the prognosis of the disease.

There were thirty-six patients in group 1 B. Their sputum was negative at the time when the results of stomach lavage were positive. Later on, however, the patients also were found positive for bacilli on routine sputum examination. The time that elapsed between obtaining the positive stomach washing and observing positive sputum varied from a few months to four and a half years in one case. The particular condition was of the minimal A type at the time the stomach washing was found positive. Now it is diagnosed as moderately advanced B with a positive sputum.

21. Poulsen, Valdemar, and Anderson, A. O.: Demonstration of Tubercle Bacilli and Significance in Prognosis, Therapy and Estimation of Danger of Infection, *Am. J. Dis. Child.* 47: 307 (Feb.) 1934.

In this group, eighteen patients (50 per cent) were found positive on smear, and all thirty-six were positive on guinea pig inoculation. Twelve of them were receiving treatment other than routine. The mortality in this group was very high; there were eight (22 per cent) deaths with two postmortem examinations. Their pulmonary infections were of recent origin, as shown first by the negative sputums which finally became positive as the disease progressed, and second by the low age incidence associated with the high mortality. This group of patients, in spite of sanatorium care and collapse therapy, have the poorest prognosis. They no doubt include those with rapidly progressive involvement who, according to Bräuning's²² observations, comprise 20.9 per cent of all patients in the beginning of the disease. They represent the "sunrise" of the disease.

GROUP 2

In group 2 there were 253 patients. They not only had clinical and x-ray evidence of tuberculosis, but all of them, with the exception of twenty, once had positive

culous tracheobronchitis, bronchial catarrh or some other cause of the positive results. All of these features afford an excellent opportunity for a clinical-pathologic investigation as to the causes.

Group 2 B is composed of 159 patients of whom 139 had positive sputum and twenty had been found positive before by stomach lavage only. All 159 patients were negative on the last stomach lavage. Of this group, 110 received some form of collapse therapy. Only three patients of twenty who were found positive by stomach lavage and not by routine sputum examination received treatment at the time of the positive washing; but, when results of stomach lavage became negative, all but three were receiving collapse therapy. There were four deaths (2.5 per cent) in this group but no postmortem examination. These patients illustrate the value of collapse therapy in pulmonary tuberculosis in producing an absence of tubercle bacilli not only in the sputum but also in the stomach washings.

Groups 2 A and 2 B are being followed further to test the effect of therapy.

TABLE 2.—Results Obtained for 824 Patients with Pulmonary Tuberculosis

Type of Lesion	Group 1				Group 2				Group 3			
	Patients with Negative Sputum				Patients Who Were Positive but Whose Sputums Were Negative for the Previous Nine Months or More				Patients Who Always Had Negative Sputums; Stomach Washing Also Negative			
	A		B		A		B		Patients Who Always Had Negative Sputums; Stomach Washing Also Negative		Positive Control Patients Who Had One or Two Positive Sputums; Stomach Washing Positive	
	Stomach Washing Positive		Stomach Washing Positive and Later Sputum Positive		Stomach Washing Positive		Stomach Washing Negative		Patients Who Always Had Negative Sputums; Stomach Washing Also Negative		Positive Control Patients Who Had One or Two Positive Sputums; Stomach Washing Positive	
	Collapse Therapy	No Collapse Therapy	Collapse Therapy	No Collapse Therapy	Collapse Therapy	No Collapse Therapy	Collapse Therapy	No Collapse Therapy	Collapse Therapy	No Collapse Therapy	Collapse Therapy	No Collapse Therapy
Minimal A.....	1	9	..	..	..	2	4	11	5	39	..	1
Minimal B.....	5	31	2	1	2	3	10	6	19	29	..	3
Moderate A.....	2	1	..	..	1	2	4	4	2	16	..	..
Moderate B.....	13	45	2	2	10	6	24	4	16	41	7	6
Far advanced A...	1	3	1	2	2	..	10	5	11	16	..	1
Far advanced B...	37	60	7	19	38	27	68	17	24	20	14	25
Primary.....	..	3	..	..	..	1	..	2	..	18	..	1
Miliary.....	..	2	..	..	..	..	..	..	..	1	..	2
Silicotuberculosis..	..	..	..	..	..	..	..	..	..	3	..	..
Total.....	59	154	12	24	53	41	110	49	79	183	21	39
	213		36		94		159		262		60	

sputum. These twenty patients were previously found positive on stomach lavage, but they were never found positive on routine sputum examination. At the time the last stomach lavages were done on this group their sputum had been negative for at least nine months on routine examination. Of these 253 patients, ninety-four were found positive on stomach lavage, while 159 were negative even by this examination. We divided this group into subgroups A and B.

In group 2 A there were ninety-four patients whose sputum had once been positive but had been negative for at least nine months on routine examination before stomach washings were found positive. Of the ninety-four patients, forty-one (43 per cent) were found positive by smear, and all ninety-four were positive by guinea pig inoculation. Of these patients, fifty-three were having other treatment than routine. There were six deaths (6.5 per cent) with one postmortem examination.

This group showed that certain patients having collapse therapy have open lesions for long intervals even though the results of routine sputum examination are negative. Many may have had small lesions on the contralateral side, only partial collapse, ulcerative tuber-

GROUP 3

Group 3 is made up of 262 patients whose condition was diagnosed as pulmonary tuberculosis by clinical or x-ray examination, or both; yet their sputum has always been negative and also their stomach washings. It is to be regretted that only forty-two of this group had repeated lavages. As Poulsen⁴ and others have pointed out, repeated lavages increase the percentages markedly. Had we repeated the stomach lavages on all 262 patients we might have found some of them positive. Yet this is not the principal cause of the negative results. One reason is that seventy-nine patients received collapse therapy; another reason is that there was a high percentage of minimal and moderately advanced lesions. In these cases of minimal tuberculosis the diagnosis was made either from a history of two or three symptoms such as fever, cough, hemorrhage, loss of weight or pleurisy or from some small shadows on the x-ray plate.

Perhaps the most interesting cause for the negative results in this particular group is that it contained a high percentage of patients in whom the disease had apparently run its course and had become spontaneously arrested or healed, otherwise known as the "good chronics." That is, there was a predominance of patients

22. Bräuning, Hermann: Der Beginn der Lungentuberkulose beim Erwachsenen. Leipzig, Georg Thieme, 1938.

belonging to clinical class A. This is indicated by the marked shift from the young adult to the patient of middle or old age in this group, as revealed in the chart.

In twenty-eight cases the diagnosis was pleurisy with effusion; in ten of them pleural fluid was found positive, in four it was negative and in fourteen it was not examined. The fourteen patients entered the Municipal Sanitarium after practically all their pleural fluid had been absorbed.

There were three deaths (1.1 per cent) in this group, but no postmortem examinations. One death occurred in the group of patients who had pleurisy with effusion; one patient had silicotuberculosis, and the third had far advanced fibroid involvement.

POSITIVE CONTROLS

A statement has been made that patients with frankly positive sputum are usually negative by stomach lavage, but we were not able to confirm it. We tried stomach lavage on from thirty to forty positive patients, and every one was positive by this test. These frankly posi-

postmortem examinations: sixteen had lung cancers (with nine autopsies and four biopsies, which confirmed the diagnoses for thirteen); eleven had lung abscess with one postmortem examination; seven had syphilis; five had gland tuberculosis; four had bronchial asthma; three had Hodgkin's disease (the diagnosis was confirmed by two autopsies and one biopsy); three had cardiac disorders; three had nontuberculous empyema; two had tuberculosis of the spine; two had nontuberculous pleurisy with effusion, and one each had bronchitis, chronic sinusitis, pneumoconiosis, idiopathic spontaneous pneumothorax, tuberculous peritonitis and carcinoma of the breast. There were seventeen in this group who died (10.4 per cent), and postmortem examinations were made on all of them. The autopsies confirmed the absence of pulmonary tuberculosis. There were eighteen patients absolutely insensitive to the Mantoux test, five reacted to the 1 to 10 dilution, and six reacted to the 1 to 100 dilution.

COMMENT

The value of stomach lavage for adults as well as for children has greatly exceeded our expectations. Perhaps the most gratifying result is the discovery that acid-fast bacilli in the stomach content are virulent and not indifferent saprophytes. Another equally important observation is that in nontuberculous conditions acid-fast bacilli are found rarely, if at all. These two facts taken together at once rule out saprophytic acid-fast bacilli and possible accidental tubercle bacilli that may be found in the mouth and stomach.

In order to support this view we aspirated the stomachs of six healthy scrub women in the Municipal Sanitarium who we thought had been markedly exposed to the tubercle bacillus. All these women showed an absence of tubercle bacilli in the stomach contents. In other words, the first observation establishes the fact that positive stomach washings indicate an endogenous origin of tubercle bacilli in the stomach region or above it. The second fact establishes proof that there is no open focus discharging tubercle bacilli and that the particular patient either is not tuberculous or has a lesion which is enclosed, arrested, or closed by treatment. All of this information is of tremendous importance in the diagnosis and differential diagnosis of tuberculosis and in the control of treatment. Stomach lavage may be called the "court of last appeal" in finding tubercle bacilli in the respiratory and upper gastrointestinal systems. This applies equally well to adults and to children. It emphasizes also the fact, pointed out by Ulmar and Ornstein,¹² that sometimes tubercle bacilli pass out of the bronchi by peristaltic waves into the esophagus without cough and without contaminating the saliva sufficiently to cause a positive reaction. Finally, it is the best method to obtain certified specimens of sputum in suspected fraud.

The first two groups represent the net profit of the method. In all, 249 patients were found positive on stomach lavage when up to that time no other test had established the diagnosis. Of this number thirty-six later became positive according to other tests, but that was perhaps due to a further evolution of the disease after the time of the analysis. Most involvements were recent or in the sunrise stage of the disease. Of 940 patients negative on direct examination, 249 (26.5 per cent) were never found positive by any other method than stomach lavage. Taking out the positive and negative controls and the subjects who were once positive leaves a total of 511 patients on

TABLE 3.—Negative Controls

Diagnosis	Number of Cases	Diagnosis Confirmed by Autopsy	Diagnosis Confirmed by Biopsy
"Apparently normal".....	52	..	..
Only healed calcified lesion.....	37	..	..
Bronchiectasis.....	25	4	..
Lung cancer.....	16	9	4
Lung abscess.....	11	1	..
Syphilis.....	7	..	..
Gland tuberculosis.....	5	..	..
Bronchial asthma.....	4	..	..
Hodgkin's disease.....	3	2	1
.....	3	1	..
.....	3	..	..
.....	2	..	..
Nontuberculous pleurisy with effusion....	2	..	..
Bronchitis, chronic sinusitis, pneumoconiosis, idiopathic spontaneous pneumothorax, tuberculous peritonitis and carcinoma of the breast.....	6 (1 of each)	..	1
Totals.....	176	17	6

tive patients, however, are not included in this group. Our positive control group consisted of sixty patients, fifty of whom were found positive by sputum only once, with from one to ten organisms per slide; the other ten patients were found positive twice. Of these sixty subjects thirty-six (60 per cent) were found positive by smear, while all sixty were positive by animal inoculation.

It is interesting to note that in a number of cases the sputum showed only one organism per slide but the smears from the stomach washings showed more than ten per field. Stomach lavages were usually done shortly after the sputums were found positive.

Only twenty-one patients in this group received treatment other than routine. There were eight deaths (13.3 per cent) with seven postmortem examinations.

NEGATIVE CONTROLS

In this group there were 176 patients. They were under observation. The sputums were always negative and the stomach washings were also negative. Of the 176 subjects, fifty-two had a normal x-ray appearance and no clinical evidences of tuberculosis or any other disease at the time of examination, while thirty-seven had calcified tubercles. These were discharged as not having any active tuberculosis. The condition of twenty-five was diagnosed as bronchiectasis, with four

whom to base percentage figures. This gives an efficiency value of 48.7 per cent for the type of material presented in this report.

In group 2 there were 253 patients once positive but negative for nine months or more on the routine sputum examination at the time stomach lavages were done. Out of these 253 subjects ninety-four (group 2 A) were found still positive by the lavage method, while 159 (group 2 B) remained negative even by lavage. In group 2 A fifty-three patients were under collapse therapy, and in group 2 B 110 were receiving this treatment.

In group 3 there were 262 patients negative on all examinations. The analysis of this group is very interesting. There were seventy-nine who received pneumothorax, which could very well account for the persistently negative observations. There were sixty-eight with minimal involvement in which the disease presumably did not advance far enough to discharge bacilli in the main bronchi. Twenty-eight had a diagnosis of pleurisy, ten of whom were positive, but the sputums were always negative. One had cold miliary tuberculosis, three had silicotuberculosis, and seven apparently had a healing type of adult primary lesion. The remaining seventy-six patients had lesions which had healed partly or entirely so that only stringy apical fibrosis or an old closed fibroid process with emphysema remained. They were in the "sundown" stage of the disease. Many such patients pass over into the negative group with bronchiectatic abscess or emphysema, some of which fail even on postmortem examination to show the tuberculous origin. Of this group fifty-four were over 30, thirty-five over 40 and eighteen over 50 years of age. Many no doubt had had the disease for decades.

In the group of negative controls there were 176 subjects. There were twenty-five cases of bronchiectasis, in most of which the disease may have been of nonspecific origin, but in some it may have been old "sterilized" tuberculosis. There were sixteen cases of lung cancer, in most of which autopsy or biopsies were performed. The eleven lung abscesses were more likely nonspecific. In the fifty-two "normal" cases there were some ephemeral processes causing the patient to be sent to the Municipal Sanitarium, but nothing could be found on clinical, x-ray or laboratory examination. In thirty-seven cases rather large calcified primary lesions were the only evidence of disease at the time of the examination made after entry to the institution. The remainder of the cases are well shown in table 3.

SUMMARY

1. A study was made of 1,000 consecutive patients who were given stomach lavage in the Municipal Tuberculosis Sanitarium, 970 of whom were over 10 years of age. Of this group, 940 were negative for tubercle bacilli by the routine concentration method, fifty were positive only once, with from one to ten bacilli per slide, and ten were positive only twice at the time stomach lavages were done.

2. The sixty patients just mentioned were found positive by stomach lavage and were used as positive controls. There was no point, however, in reporting cases strongly positive.

3. There were 176 negative controls whose clinical and x-ray aspect pointed definitely to a normal status at the time of examination or to diseases other than lung tuberculosis. All were negative on stomach lavage.

4. There were 253 patients who had been positive but were negative for nine months or longer, by routine

examination, before the stomach lavage was performed. Of these, ninety-four were positive by stomach lavage and 159 remained negative.

5. Of the remaining 511 patients always negative by routine methods, 249 (48.7 per cent) were positive by the stomach lavage method alone.

6. Of the remaining 262 patients always negative, seventy had early minimal or moderately advanced involvement; seventy-nine received pneumothorax therapy; twenty-eight had pleural effusions, and seventy had terminal fibroid lesions where infiltrative foci had disappeared and only stringy fibrosis or fibroid cavities remained. This left only twelve patients to be divided up among a number of complications or unusual features.

7. Of 403 with stomach washings positive by guinea pig inoculation, 161 (40 per cent) were positive by smear.

8. Of 824 patients with pulmonary tuberculosis, 334 had some form of collapse therapy, which has been present from two months to several years. Of these 334 patients, seventy-nine (23.7 per cent) were never permitted to become positive and 110 (32.9 per cent) became negative by stomach lavage, while 145 (43.7 per cent) were still positive by stomach wash.

9. In this study of 1,000 cases we did not include any unusual observations or make any comparison between the efficiency of the stomach wash and that of the sputum culture. We have such a comparison under investigation at the present time.

CONCLUSIONS

1. Stomach lavage will find tubercle bacilli that become free in the larger bronchi in a manner not equaled by any other method used at present.

2. The patients having tuberculosis who are not found positive for tubercle bacilli by stomach lavage include those with early minimal or moderately advanced lesions which have remained isolated or have been confined to the pulmonary parenchyma or otherwise have not disseminated bacilli into the larger bronchi; completely encapsulated lesions, and extrapulmonary tuberculosis, none of which discharge bacilli into the bronchi or pharynx.

3. Completely healed tuberculous lesions and non-tuberculous diseases are uniformly negative by stomach lavages.

4. As stomach lavage seems to come nearer than any other method to finding all virulent tubercle bacilli, it should be adopted as the ultimate standard for absolute negativity or apparent cure of patients having had or suspected of having tuberculosis. It is also useful in the elimination of frauds.

5. While it is not practical or even necessary for universal use, the efficiency of any method used or recommended for practical use may well be standardized by it.

6. It is an excellent method to control the efficiency of collapse therapy.

7. It should be emphasized again that during collapse therapy the absence of tubercle bacilli in only one stomach washing does not necessarily signify that the disease is arrested. The washings must be repeated at frequent intervals. Especially is this true when the collapsed lung is reexpanding.

8. No patient with clinical signs of tuberculosis who has negative sputum should be considered negative until gastric aspiration has yielded negative results.

DIAGNOSTIC VALUE OF OCCULT
HEMATURIAA STUDY OF 3,000 SPECIMENS OF URINARY
SEDIMENT

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This article is based on an investigation concerning the meaning and clinical implications of occult blood in the urine. To this end we examined 3,000 specimens of urine obtained from 681 ambulatory patients. The group, in the main, was made up of patients with cardiac, vascular, circulatory, renal, nutritional and other nonacute types of diseases. It did not include gross hematuria such as occurs in from 40 to 60 per cent of patients whose disorders are finally diagnosed as surgical conditions of the genito-urinary tract.

THE TOLIDINE TEST

A small amount of blood or hemoglobin is best detected by the orthotolidine test, which is sensitive up to 1 part of blood in 24,000 parts of urine. One

TABLE 1.—Influence of Sex on Hematuria

Sex	Number of Patients	Positive Tolidine Reaction, %
Male.....	321	40
Female.....	360	60

TABLE 2.—Hydrogen Ion Concentration and the Tolidine Reaction

pH of Urine	Number of Tests	Positive Reaction, %
2.....	2	50.0
4.....	60	18.3
6.....	150	36.7
8.....	310	42.0
10.....	25	32.0

drop of blood in 1,500 cc., an average daily output, will give a positive reaction. For clinical purposes this chemical method of detecting blood in the urine is more accurate than the usual microscopic search for red blood cells; it yields a greater number of positive results. Its interpretation, however, must be tempered with clinical judgment. While the presence of a positive occult blood reaction indicates bleeding somewhere along the urogenital tract and nothing else, one must interpret its clinical significance in the light of medical experience.

The orthotolidine test has been used to detect blood since its introduction by Ruttan and Hardisty in 1912.¹ Stone and Burke² in 1934 observed that (1) when red blood cells are present in the urine a positive tolidine reaction will be found, (2) that red blood cells in the urine are not ordinarily detected with the microscope until their number exceeds 5,000 per cubic centimeter of urine, and (3) that persistent observation of more than 1,000 red blood cells per cubic centimeter is of clinical significance and merits further consideration.

Read before the Allegheny County Medical Society, Pittsburgh, April 18, 1939.

1. Ruttan, R. F., and Hardisty, R. H. M.: *Canad. M. A. J.* 2:995, 1912.

2. Stone, W. J., and Burke, G. T.: *Improved Test for Occult Blood, Especially in Urine*, J. A. M. A. 102:1549 (May 12) 1934.

It need hardly be emphasized that the detection of even small amounts of blood in the urine is desirable in clinical work at all times.

Our observations cover a period of four and one half years, during which time we have had ample opportunity to note the frequency and intensity of the reaction with various disease states. We found it convenient and sufficiently accurate to classify the reactions as grade 1, 2 and 3. As outlined by Stone and Burke and verified by ourselves, grade 1 (1 plus) corresponds to from 1,300 to 1,500 red blood cells per cubic centimeter of urine, 2 plus corresponds to from 4,000 to 7,000 red blood cells per cubic centimeter, and 3 plus corresponds to from 15,000 to 20,000 red blood cells per cubic centimeter.

In performing the test, 15 cc. of urine is centrifuged at high speed for five minutes. After the supernatant liquid has been decanted and discarded, part of the sediment is used for the usual microscopic examination. To the remainder of the sediment in the centrifuge tube is added 2 drops of 1 per cent solution of orthotolidine in methyl alcohol, followed by 4 drops of acetic acid-hydrogen peroxide mixture (glacial acetic acid 1 part and commercial hydrogen peroxide 2 parts). Positive reactions consist of a greenish blue lasting one minute (1 plus), a deeper blue lasting up to two minutes (2 plus) and a deep blue lasting more than two minutes (3 plus). Strong alkalis, as 10 per cent sodium hydroxide, will give a positive reaction, but the common organic or inorganic urinary constituents do not. Iodides or bromides in the urine will give a falsely positive reaction, consisting of a deep bluish black with precipitation of black granules. Excess ascorbic acid in the urine, as during tests or administration of vitamin C, will inhibit the orthotolidine reaction and prevent its appearance.

INCIDENCE

Of 3,000 specimens taken from a group of 681 general medical patients, we found that 33 per cent showed positive tolidine reactions. At the same time we also found that 67 per cent of these 3,000 specimens showed positive reactions for albumin in the urine. These figures clearly indicate that occult blood in the urine, as revealed by the presence of hemoglobin, is one thing and that serum albumin as it occurs in the urine is another. If this incidence of hemoglobin and albumin seems high, it should be recalled that we are dealing here with patients who have recognized diseases and those in whom circulatory disturbances in the renal glomeruli or mucous membrane of the genito-urinary tract are to be expected.

AGE AND SEX

To gain an insight into the meaning of the presence of occult blood in the urine we segregated a group of 100 younger patients up to the age of 20, consisting of forty-eight males and fifty-two females. In this group of 100 we found that one third gave positive tolidine reactions. We also noted that in this group of young patients showing traces of blood in the urine the sexes were evenly divided, with twenty-seven males to twenty-six females. As will be seen later, occult bleeding is somewhat less common in young than in older patients.

Influence of sex on the presence of occult hematuria (table 1) is as follows: The group of patients with positive tolidine reactions consisted of 40 per cent males and 60 per cent females. The excess of females over males is probably to be accounted for by a greater source of bleeding in the female, the generative tract.

SEASONAL INFLUENCE

Since these observations covered a period of four and one half years, we were interested in the possibility of seasonal variations, with their contrasting temperatures, the changes in activity of the circulatory system and the various physiologic responses which may come in the course of a year. The accompanying chart shows however that seasonal factors are not constant, although our highest incidence occurred during the height of the summer.

RELATION OF POSITIVE TOLIDINE REACTION
TO ALBUMINURIA

The entire group of 681 patients had 3,000 tests for detection of occult blood, averaging more than three tests per patient, although some had many more and the others less. Of these, 24 per cent of the positive reactions were in males and 42 per cent in females. It is noteworthy that of the 3,000 specimens 67 per cent also showed albumin in the urine. This, of course, includes a large proportion of samples showing mild albuminuria which was not an indication of existing nephritis. Further analysis revealed that 63 per cent of the males and 71 per cent of the females in the entire group showed albuminuria.

While this incidence of occult blood and albumin seems high, it must be recalled that we are dealing here with patients seeking medical aid for well defined diseases. That both the incidence of occult blood and the incidence of albumin were higher in the female than in the male is to be explained on the basis of the more extensive areas of mucous membrane in the generative tract of the female.

ABNORMAL DEXTROSE METABOLISM AND OCCULT
BLOOD IN THE URINE

The questions arose as to whether occult blood in the urine is more common in patients having hyperglycemia and glycosuria and as to whether the diabetic state per se may cause direct injury to the smaller blood vessels and capillaries with resulting bleeding. In an analysis of the data for 100 diabetic patients during

TABLE 3.—Occult Hematuria in Various Diseases

No. of Cases	Disease	Red Blood Cell Average, Million	Hemo-globin Average, %	Tolidine Reaction
6	Severe anemia.....	3.78	36.0	+++
11	Diabetes and cardiovascular renal disease.....	4.43	77.4	+++
25	Cardiovascular renal disease.....	4.53	77.4	+++
9	Chronic nephritis.....	4.60	76.5	+++
62	Miscellaneous diseases.....	4.64	79.7	+++
41	Diabetes, uncomplicated.....	4.83	81.0	+++

periods of hyperglycemia and glycosuria we found that there actually was a lower incidence of occult blood during these periods. As far as these observations go, we have no evidences indicating that the diabetic state of the patient is accompanied by immediate capillary injury or occult bleeding.

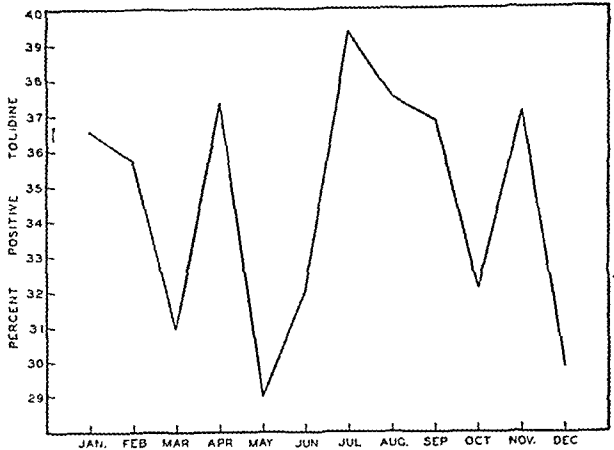
ADMINISTRATION OF ARSPHENAMINE AND
OCCULT HEMATURIA

Of a group of seventy patients who received intravenous injections of arspenamine, we note that whereas 30 per cent had positive tolidine reactions before the injections only 20 per cent had positive reactions after the injections. It therefore appears that this arsenical

does not have any immediate injurious effects on the renal glomeruli as far as blood or capillary injury is concerned.

HYDROGEN ION CONCENTRATION AND THE
TOLIDINE TEST

The tolidine reaction was neither more nor less marked in acid or alkaline urine. Most of the specimens ranged in hydrogen ion concentration between



Seasonal influence on occult hematuria (3,000 specimens of urine, 1934-1938).

6 and 8, which is within the normal range (table 2). Thus it appears that the hydrogen ion concentration of the urine is not a factor and has no influence on the tolidine test.

BLOOD COUNTS AND OCCULT HEMATURIA

The next question that presented itself was whether such occult bleeding in the genito-urinary tract may be one of the underlying causes of secondary anemia, so frequently seen in this type of patient, or whether the fault resides in defective blood regeneration or other causes. We therefore correlated a group of 154 patients whose urinalyses revealed a 3 plus tolidine reaction, which means a continuous loss of from 15,000 to 20,000 red blood cells per cubic centimeter of urine. In this analysis we found first that the red blood cell values are not strikingly lower than for any other mixed group of patients and second that the hemoglobin level was relatively lower than the red cell value, which suggests definite hypochromia.

OCCULT HEMATURIA IN VARIOUS DISEASES

Of the 681 patients, groups with various diseases are classified according to the degree of anemia (table 3). All of these had 3 plus tolidine reactions, which means well marked occult blood in the urine. It will be seen that severe secondary anemia, diabetes with active cardiovascular renal disease, pure cardiovascular renal disease, chronic nephritis and uncomplicated diabetes appear in this table in their positions of relative severity. It is also apparent that the relative positions in this table correspond with our clinical conceptions of the seriousness of these diseases. How much the occult bleeding is responsible for the anemia present in these cases is not an easy matter to decide.

OCCULT HEMATURIA IN SERIOUS DISEASES

The clinical significance of a positive tolidine reaction and its value as an index of serious disease may be inferred from our observations on a group of 662 patients with various diseases. Subdivided into disease

groups, 375 patients showed an incidence of positive tolidine reactions in from 50 to 89 per cent of the cases. Table 4 shows this incidence and the type of disease in which the highest percentage of occult blood was found in the urine. Thus we note that foremost in this list was a group of diabetic patients with recognized cardiovascular disease. After this was chronic nephritis; then came genito-urinary diseases, then cardiovascular renal diseases including cardiac and hypertensive states with or without nephritis. These were followed by pernicious anemia, tuberculosis, asthma, arthritis and other conditions.

All of this tends to show that the presence of a positive tolidine reaction in the urine is significant. In the absence of a diagnosable constitutional disease it may only mean unimportant occult bleeding somewhere along the urinary tract. But in the presence of one of the constitutional diseases it is more likely to serve as an index of the extent to which that disease involves the renal glomeruli or smaller blood vessels or capillaries. In a disease such as diabetes with cardiovascular disease, only 11 per cent of the patients did not show occult bleeding; in chronic nephritis all but 12 per cent had occult bleeding. In pure cardiovascular renal diseases, including essential hypertension and other conditions, 37 per cent had negative reactions, whereas

TABLE 4.—Various Diseases and the Tolidine Reaction

Number of Cases	Disease	Positive Tolidine Reaction, %
35	Diabetes and cardiovascular disease.....	89
16	Chronic nephritis.....	88
14	Genito-urinary disease.....	71
104	Cardiovascular renal disease.....	63
172	Diabetes (uncomplicated).....	58
8	Pernicious anemia.....	50
8	Tuberculosis.....	50
8	Renal glycosuria.....	50
6	Asthma.....	50
4	Arthritis.....	50

in uncomplicated diabetes 42 per cent had negative reactions. Thus positive occult blood reactions have their well defined clinical meanings, and absence of occult hematuria takes on a prognostic significance in the order of first importance. A negative occult blood reaction gives one assurance of intact vessels in the urogenital tract, which is one of the most important systems in the human organism.

SUMMARY AND CONCLUSIONS

Orthotolidine is a sensitive test for occult hematuria. A positive orthotolidine reaction was found in one third of 681 general medical cases of the so-called chronic diseases. It is less common in youth, with more intact vessels, and it is more common in females than in males on account of the greater source of bleeding in the female generative tract. Seasonal variation pointed to the highest incidence during the summer months. Albuminuria and occult blood are found independently of each other, each having its own significance. Glycosuria is not a cause of occult bleeding. Arsenicals in therapeutic doses do not cause occult bleeding. Alkalinity or acidity of the urine is not a cause of occult bleeding. In patients showing persistent occult hematuria, hypochromic anemia is common. A review of the type of case in which the strongest reactions occurred reveals that these reactions were most pronounced in the clinically recognized serious types of disease and that the test reflects the patient's actual condition.

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FOOD-BORNE INFECTION WITH SALMONELLA AERTRYCKE

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The terms "food poisoning" and "ptomaine poisoning" are frequently used in the diagnosis of an acute illness characterized by vomiting, cramps, diarrhea and elevation of temperature. Both terms are unsatisfactory, but, of the two, "ptomaine poisoning" is the more misleading and incorrect, for actual food poisoning rarely if ever occurs. Since vomiting is often the first symptom, it is perhaps natural that suspicion should be directed to the food eaten and vomited.

Investigators in food poisoning have suggested various classifications; none have been found satisfactory unless they are based on etiology. In general, food poisoning is classified in two groups: infection and toxemia. Food infection is the result of contamination of food with various types of living bacteria. Food toxemia is due to the ingestion of food which contains preformed bacterial toxins; botulism is the example in this class.

Rosenau¹ says: "Most instances of food poisoning are from food that is fingered and fussed over, inadequately processed or imperfectly preserved. There is little danger in fresh, clean food, whereas food that is prepared hours before it is eaten gives opportunity for the growth of bacteria. The chief offenders in food infection are meat, milk and mixtures containing these products."

Food infection is an acute disease, usually associated with one of the *Salmonella* group, although streptococcus and staphylococcus outbreaks have been reported. The symptoms of food infection are those of acute gastrointestinal irritation with nausea, vomiting, diarrhea, prostration, dehydration and a rise of temperature to 102 F. or even higher. The severity of the symptoms varies according to the strain of the organism and the dose. The onset is sudden; usually from six to fifteen hours elapses from the time the food is eaten to the beginning of the first symptoms, although cases have been reported in which the illness began immediately on ingestion of the infected food.

Numerous epidemics of food poisoning have been reported in this country and abroad. Gartner in 1888 did much to clear the mystery concerning food poisoning when he reported a *Salmonella enteritidis* outbreak in Frankenhansen. Fifty-seven cases occurred with one death, and it was determined that the disease was due to eating meat of a cow which was slaughtered on account of enteritis. The infecting organisms were recovered from the organs of both the cow and the patient who died. Owing to the fact that greater pre-

Dr. Brown was formerly secretary and executive officer, Kansas State Board of Health.
Read before the Conference of Health Officers of the New York Metropolitan Area, Lido Beach, N. Y., July 25, 1932.
1. Rosenau, Milton J.: *Preventive Medicine and Hygiene*, ed. 6, New York, D. Appleton-Century Company, Inc., 1935.

cautions are now exercised in the processing and preparation of food, these infections occur less frequently than in the past.

Bainbridge reported at least 261 outbreaks in Germany between 1898 and 1908 due to infection with either *Salmonella suipestifer* or *Salmonella enteritidis*,

Geiger² surveyed 749 outbreaks in this country which occurred from 1910 to 1922 inclusive and involved 5,210 persons with 399 deaths. Forty-four outbreaks were due to botulinus infection with 172 cases and 140 deaths; fifty-four outbreaks, with 2,219 cases and eleven deaths, were due to the eating of food contaminated with organisms of the paratyphoid group. In 404 outbreaks the diagnosis was given as ptomaine poisoning by physicians, and in 147 additional outbreaks this was the diagnosis according to newspapers carrying reports of the occurrences. In 212 outbreaks the assembled data indicated conditions other than food poisoning.

Savage³ tabulated 112 British outbreaks of bacterial origin from 1878 to 1918, and 121 from 1919 to 1931 inclusive. In the latter series seventy-six, or 63 per cent, were due to infection with *Salmonella aertrycke*, fourteen, or 12 per cent, to *S. enteritidis* and seven, or 6 per cent, to *S. suipestifer*.

Lecoq in Paris published in 1906 a monograph on poisoning caused by whipped cream. He showed that the poisoning properties of mixtures of cream, gelatin and white of eggs had long been known but that the poisonous properties which appeared most frequently in the summer were due not to metallic poisons but to bacterial infection of the egg albumin. The method of infection which he thought most likely was the introduction of infective material into the oviduct of the duck during copulation, with infection of the albumin as it was being deposited around the yolk. Lecoq recited numerous observations of foreign bodies such as straws, seeds and stones found embedded in eggs and obviously introduced in this manner. The greater frequency of infection of duck's eggs was explained by the fact that ducks "practice their amours" in ponds and ditches, where specific contamination of the water may easily be present.

Scott⁴ in 1930 reported seven British outbreaks in which duck's eggs were the vehicle of infection. The largest outbreak in this series involved more than 300 persons with one death, the vehicle being ice cream. Although proof was not entirely complete it appeared that a duck's egg infected with *Salmonella aertrycke* and used in the manufacture of the ice cream was responsible. The ice cream contained an abundance of *S. aertrycke*, while none of the other ingredients of the mixture except the eggs could be suspected.

Scott also directed attention to another method of infection of the eggs. Eggs of both ducks and hens, if kept dipped in cultures of *S. aertrycke*, may become infected in a few days. If the culture is simply allowed to dry on, infection fails; part of the shell must remain moistened for penetration to occur.

Authorities are agreed that the diagnosis of food infection depends on the following general principles: (1) history of exposure to the suspected food, (2) symptoms suggestive of food poisoning, (3) isolation of the infecting bacteria from the suspected food and also

from the blood, urine, feces or viscera of the patient, (4) specific identification of the causative organism, and (5) demonstration of agglutinins in the blood serum of the patients.

Numerous outbreaks of food infection have been reported in medical literature in this country; reports of *S. aertrycke* infection are rare. It is desired, therefore, to report an outbreak of fifty-two cases in which *S. aertrycke* was the active cause and was transmitted by food.

One of us (G. R. C.) for many years had been attending physician to an orphanage for boys and girls of ages ranging from 5 to 17 years. The building occupied by the boys is more than half a mile distant from that occupied by the girls, although the two are operated by the same religious order. The milk supply, produced at the boys' home, is shared with the girls' home. The water supply for each is secured from the municipal system. Sewage disposal at the home for boys is by means of a septic tank, and the effluent drains into a small creek 150 yards distant.

On the morning of May 27, 1936, we were notified by telephone that a large number of the boys were ill. The call was answered promptly and it was discovered that, in addition to development of a sudden illness among the boys, several adult attendants also were ill. The symptoms were those of an acute infection with sudden onset, nausea and vomiting, fever, severe diarrhea (many had bloody stools) and extreme prostration. Temperatures varied from approximately 100 to 106 F. The patient with the latter reading was removed to the hospital, and the illness resulted fatally.

In the first case illness developed at about 1 o'clock on the morning of May 26, and in two other cases the onset occurred between that hour and 5 o'clock. In the great majority of cases onset took place between the latter hour and 6 o'clock of that evening, with an interval of approximately thirteen hours.

We immediately suspected a food-borne epidemic. Illness had not occurred at the girls' home, and therefore water and milk were not involved. The meal which was eaten at 6 o'clock on the evening of May 25 consisted of chopped fried beef, boiled potatoes, mustard greens, bread and butter, milk and rice custard pudding.

A telephone report of the occurrence of the outbreak was made to the state department of health. Representatives of this department arrived five hours later to continue the investigation.

The boys as well as the adult attendants were housed in two brick buildings, both being exceptionally clean. Flush water closets in the two buildings were in satisfactory condition. There were four frost-proof toilets in an outbuilding, approximately 35 yards from the main building. These toilets were in disrepair, although showing evidence of recent use.

The meals were prepared and served in the main building. Screening on the windows and doors of both kitchen and dining room was defective. Flies were found in large numbers in both of these rooms.

Of the various foods which were eaten, rice custard pudding was the most likely vehicle of infection. The rice was boiled during the early morning and allowed to stand on the table for several hours. The custard was prepared during midafternoon, mixed with the rice and then allowed to stand for an unknown length of time before being placed in the refrigerator. In making the custard, among other ingredients, four

2. Geiger, J. C.: Poisoning by Food, Probably Due to Contamination with Certain Bacteria, *J. A. M. A.* 81: 1275 (Oct. 13) 1923.
3. Savage, W. G.: Some Problems of Salmonella Food Poisoning, *J. Prev. Med.* 6: 425 (Nov.) 1932.
4. Scott, W. M.: *Brit. M. J.* 2: 56 (July 12) 1930.

duck eggs and two hen eggs were used. Since those who had prepared the custard were also ill, they could not have been the primary source of the infection.

Approximately 1 pint of the rice pudding remained in the refrigerator. On laboratory examination, *S. aertrycke* was isolated from the pudding and also from the stools of seventeen patients, one of whom died.

The fifty-two patients were distributed by age groups as follows: from 5 to 9 years, fifteen; from 10 to 14 years, twenty-two; from 15 to 19 years, six, and over 21 years, nine. Included in the adult group were two men and seven women, each having a part in the management of the home or of the small farm which supplied potatoes and other vegetables. Seven adults and twelve boys were not ill, having eaten the pudding either not at all or in only a small amount. In some cases this was reported as a "taste" or a spoonful.

All patients were exceedingly toxic, the apparent result of a massive dose of the infection. It was not considered that flies could be responsible because the time elapsing between preparing and eating the pudding was not sufficient to allow for incubation of the organisms. Therefore the investigation was directed to the possibility of infection resulting from the use of duck eggs in preparation of the pudding.

Cultures were made from eighteen freshly laid eggs within twenty-four hours from the time they were laid, without recovering the organism.⁵ Cultures were taken from the outside of four eggs, and *S. aertrycke* was recovered from two.

Certain experimental work was then undertaken. Two eggs were placed in a Petri dish in which filter paper was moistened with sterile water. A third egg was washed and wrapped in filter paper moistened with broth culture of *S. aertrycke* isolated from the custard, and a fourth egg was inoculated by hypodermic syringe with a similar culture, the hole being sealed with paraffin. One egg, used as a control, was placed in a sterile Petri dish without other attention. All eggs were allowed to stand at room temperature for one week. At the end of this period the eggs were broken and cultures were made from them. The control egg was negative for organisms, but *S. aertrycke* was recovered from the other eggs. This indicated that under certain conditions the organism would penetrate the shell.

Ducks lay their eggs in a casual manner, dropping them wherever they may be feeding. Duck eggs are usually dirty when gathered, and if they remain on the ground for several days it is possible that the organism will penetrate the shell. If the infection is in the oviduct, the organism may enter the egg during its development.

There were twenty-one ducks on the property; the eggs were used only for cooking. These fowl had the run of the small farm, which was fenced, including the creek. Fecal specimens were secured from all of the ducks. *S. enteritidis* was isolated from nine specimens, *S. aertrycke* from six and both organisms from three, while three were reported negative for both organisms. *S. aertrycke* and *S. enteritidis* were also isolated from the septic tank effluent where it entered the stream.

Blood specimens were then secured from the nine ducks whose feces had been positive for *S. aertrycke*. Ordinarily, blood is taken from fowls by inserting a

needle into the humeral vein beneath the wing. This method was attempted, but only a few drops could be obtained before the blood coagulated in the needle. The following method was then used: The ducks were held by the wings with the body and feet hanging down. A foot was cleaned with alcohol, one of the large veins in the web was punctured, and the blood was allowed to drip into sterile tubes. By using this method, a sufficient sample was easily obtained from each of the ducks.

The blood of three ducks agglutinated the organism isolated from the custard and from the stools of various patients. These ducks were purchased but did not lay any eggs after they were brought to the laboratory. At the end of fourteen days they were killed, autopsies were performed, and cultures were taken from the oviduct of each. *S. aertrycke* was recovered from one on direct culture and from the second on enrichment. Cultures from the third duck were negative.

In a further investigation of the possible source of the infection, it was learned that the man in charge of the farm became sick on May 21. His symptoms were similar to those of the others who were ill. Although he had severe diarrhea, he continued his work and defecated frequently on the floor of a shed adjacent to the barn, to which shed the ducks had free access. *S. aertrycke* was recovered from the stools of this man more than two weeks after the onset of his illness.

This farmer lived in his own home approximately a mile from the orphanage. His wife had not been ill and her stools were negative for *S. aertrycke*. He did not eat at the orphanage or handle any of the food and denied having used the toilets. The source of his infection was not determined.

Rice custard was the vehicle of infection in this outbreak. Duck eggs which were used in preparation of the pudding were, without doubt, responsible for contamination of the pudding. Infection of the eggs could have occurred during their development in the oviduct, or organisms could have penetrated the shell if a period of several days intervened between the time the eggs were laid and were collected.

SUMMARY

1. An outbreak of *Salmonella aertrycke* infection occurred in an orphanage for boys.
2. Of the fifty-five boys and sixteen adults living in the orphanage, forty-three boys and nine adults were sick. One death occurred.
3. All persons who were ill had eaten rice custard pudding.
4. Onset of the first case occurred approximately seven hours after ingestion of the suspected food.
5. *S. aertrycke* was isolated from the pudding and from the stools of seventeen patients, including the one who died.
6. *S. aertrycke*, either singly or in combination with *Salmonella enteritidis*, was recovered from the feces of nine ducks. The blood of three ducks agglutinated the organism recovered from the pudding as well as the organism isolated from the stools of various patients. On autopsy, *S. aertrycke* was recovered from the oviduct of two ducks.
7. The infection was transmitted in rice pudding. The infecting organisms were contained in the duck eggs used in making the pudding, in sufficient quantities to result in massive infection of the custard.

5. The laboratory work was done by Ross L. Laybourn, M.S., bacteriologist in charge, Public Health Laboratory, Kansas State Board of Health, since deceased. References to such work in this paper are taken from his notes.

TEMPORAL ARTERITIS

GEORGE F. DICK, M.D.

AND

GUSTAVE FREEMAN, M.D.

CHICAGO

Horton and Magath¹ reported eight cases of temporal arteritis in 1937. Five of these they had studied personally. One of the cases occurred in Uruguay. The same year MacDonald and Moser² reported a case and compared the disease with periarteritis nodosa. Jennings³ reported two cases from England in 1938 and discussed the similarity of temporal arteritis to periarteritis nodosa, thrombo-angiitis obliterans and rheumatic arteritis. Two more cases are described here.

There is a striking similarity clinically and pathologically among all the cases that have been described in detail. The range in age has been between 55 and 80 years, the average being 67. Six of the thirteen patients were between 65 and 70. More women than men have been affected. Weakness and general malaise prior to and during the local involvement of the arteries about the head were common. The prodromal symptoms varied in duration from two weeks to eight months, although it is not clear whether the contiguous signs and symptoms are related to this disease. In some instances the disease dated from an infection of the respiratory tract and was followed by muscle and joint pains. All the patients had headaches. These were often throbbing in nature and associated with tenderness of the scalp and painful mastication. The swelling and redness of the periarterial tissues usually followed the onset of headache. Fever was invariably present during the height of the disease, generally remaining below 103 F. In several instances impairment of vision resulted from damage to the retinal vessels. Muscular weakness was pronounced in our second case. It seems usual for the patient to discover tender swelling over the temporal arteries or behind the ears or to feel pain around an eye. In several instances one side of the face swelled and became tender, followed by a similar series of events on the other side. Tender swellings appeared frequently over the entire scalp. In one case even the buccal cavity became swollen and tender. Jennings described involvement of the arteries in an arm. Horton and Magath reported that the disease lasted from four to six months, but one of our patients was sick for thirteen months. Thus far the disease has always been incapacitating. Despite the advanced age distribution, none of the patients died of the disease.

Investigation of the pathologic changes is limited to the small number of excised portions of temporal arteries. Only ophthalmologic examination has thrown light on the picture of the disease process in the smaller arteries. The portions of temporal arteries removed were relatively firm and rigid. Their lumens were narrow and sometimes completely occluded (fig. 1). The walls were markedly thickened. Microscopically the media and adventitia were profusely invaded by

mononuclear inflammatory cells (figs. 2 and 3). In places the musculature was replaced by masses of granulomatous inflammatory tissue. Occasionally hemorrhages appeared in the media. Proliferation of the intima was considerable but not specifically different from that seen in arteriosclerosis, although atheromatous material was not commonly seen. The elastic laminae were usually obliterated. The most characteristic elements of the inflammatory reaction in the arteries were the large giant cells. These were scattered throughout the media in conjunction with the inflamed areas. These cells were quite large and contained many nuclei. Sometimes they were poorly preserved and appeared to be compressed. It has not been possible to demonstrate organisms in the tissues by bacterial stains. No specific cellular aggregations were found constituting tubercles, gummas or Aschoff bodies. The lumens were greatly reduced in width and thrombi occasionally obliterated them entirely.



Fig. 1 (case 1).—Cross section of right middle temporal artery. Reduced from a photomicrograph with a magnification of 65 diameters. (Hematoxylin-eosin stain.)

REPORT OF CASES

CASE 1.—A woman aged 65 had been living in Illinois all her life. At 29 she was jaundiced and had vomiting attacks. At 63 she had influenza. She has been able to distinguish only light and dark with her right eye. In December 1937 she had an attack of influenza which lasted three weeks. This attack was accompanied by fever and a bloody mucopurulent discharge from the nose. Immediately on recovery the patient noted pain and tenderness behind each ear. This persisted for three weeks.

She was well until May 1938, when bronchopneumonia developed, lasting five weeks. During the middle of June the left eye became swollen and painful. This condition subsided in a few days but the right side of the face became swollen, tender and firm. Even the roof of the mouth was involved. A week prior to admission to the hospital the left side of the face and neck became affected similarly. Pain was prominent in the jaws and mouth. Cordlike swellings were felt along the occiput, behind the ears and over the temples.

The patient was acutely ill and undernourished. Subcutaneous swellings were felt in the regions of the occipital, posterior

From the Department of Medicine, University of Chicago.

1. Horton, B. T., and Magath, T. B.: Arteritis of Temporal Vessels: Report of Seven Cases, *Proc. Staff Meet., Mayo Clin.* 12:548 (Sept. 1) 1937.

2. MacDonald, J. A., and Moser, R. H.: Periarteritis and Arteritis of Temporal Vessels: Case Report, *Ann. Int. Med.* 10:1721 (May) 1937.

3. Jennings, G. H.: Arteritis of Temporal Arteries, *Lancet* 1:424 (Feb. 19) 1938.

auricular, parietal and middle temporal arteries. The middle temporal and supra-orbital arteries felt like firm cords except for the pulsation. The retinal veins appeared engorged. A mucoid discharge came from the nose. The teeth were carious and broken. The temporomandibular joints were painful and limited in motion. The submaxillary, anterior and posterior cervical lymph nodes were enlarged and tender. A systolic murmur was heard over the entire precordium. The second pulmonic sound was louder than the second aortic. The radial and brachial arteries were thick. A few small mucosal hemorrhages were seen on the palate.

The patient was hospitalized for seven and one half weeks. The temperature usually had an afternoon peak of 100 F. After a total of 13.2 Gm. of sulfanilamide was administered

taken from the throat. A blood culture showed no growth. *Streptococcus viridans* grew in a culture made from the temporal artery.

The patient was feeling well in September.

CASE 2.—A woman aged 76, who had come to Chicago from Sweden fifty years before, had frequent sore throats all her life. In 1918 she had influenza. Four years later the gall-bladder was removed. In 1928 she had acute tonsillitis. In 1936 her right knee became swollen and tender.

In November 1937 the patient began to have severe frontal headaches. The aching included the eyes and the face as far down as the lower jaw. These headaches persisted until June 1938. In April 1938 tender swelling of the left temporal artery appeared. Then the right side became involved. Soreness of the eyes and blurred vision followed. There was diplopia for one week. Her muscles were sore and the joints felt stiff. Examination in June revealed large, firm, tortuous pulsating temporal arteries, tenderness of the scalp, tortuous retinal arteries, sluggish extra-ocular movements, poor vision in the right eye, inflamed tonsils, adenitis, enlarged cervical lymphnodes and a blood pressure of 172 systolic, 80 diastolic. Between June and October the headaches were absent but the patient did not improve otherwise. In October the temporal arteries looked the same. Examination revealed warm and moist skin, enlarged anterior cervical lymph nodes, small tender swellings over the occiput and small cysts on the surfaces of the tonsils.

The patient was hospitalized for twenty-three days. She had constant night sweats. The muscle soreness and stiffness in the joints improved. The temperature ranged from 99.2 F. to 100.4 F. daily. Sulfanilamide was administered for eight days without effect. There was an occasional trace of albumin and a moderate number of white cells in the urine. The red cell count was 3,350,000 per cubic millimeter and there was 10.3 Gm. of hemoglobin. The blood count became normal with iron therapy. The Wassermann and Kahn reactions were negative. The sedimentation rate and cell volume were normal. The urea clearance was moderately reduced. The blood urea was 18 mg. per hundred cubic centimeters of blood. No free acid was obtained from the stomach after histamine. X-ray examination of the skull was negative. There was marked widening of the innominate artery, according to the film, and the sinuses were clear. An electrocardiogram showed a tendency toward left axis deviation.

It was not until two months later that the vascular signs subsided.

COMMENT

Jennings questioned the specificity of the syndrome and compared it with periarteritis nodosa, rheumatic arteritis and thrombo-angiitis obliterans. Nevertheless he points out more differences than similarities and by description strengthens the view that temporal arteritis is not the same disease as any one of the others. The characteristics they have in common are fever, sweating, loss of weight, anemia, muscle and joint pains, periarteritis, medial inflammatory reactions with hemorrhages, intimal proliferation and thrombosis. The clinical symptoms are those of inflammatory involvement of blood vessels. Pathogenically the changes in common are those expected in chronic inflammation of arteries regardless of etiology. The several clinical entities are obscure etiologically but are considered to be separate diseases according to our present state of knowledge by virtue of clear clinical differences. For similar reasons temporal arteritis should be isolated at present as an individual entity.

The pathologic material obtained is insufficient to give a satisfactory picture of the disease. The important differential element in the inflammatory process is the invariable presence of large giant cells in the walls of the arteries. No aneurysms have been noted on biopsy of the temporal arteries. The giant cells have not been associated with other cellular elements to form



Fig. 2 (case 1).—Inflammatory reaction including giant cell in media. Reduced from a photomicrograph with a magnification of 1,050 diameters. (Hematoxylin-eosin stain.)

over a period of seven days the temperature rose to 100.4 F. and then returned almost to normal the following day. The drug was stopped when a rash appeared. Sulfanilamide was given again for two days with a consequent rise in temperature and a rapid return to normal. While the patient was in bed, vision in the left eye became blurred. The optic disk was twice normal size and was slightly edematous. A small hemorrhage was present on the disk. The visual field was reduced to a small point. A biopsy was made of the right middle temporal artery.

The urine and stools were essentially normal. The leukocyte count ranged between 6,300 and 13,100 cells per cubic millimeter. The differential counts were not unusual. The hemoglobin varied from 70 to 78 per cent. The erythrocyte count ranged between 4,500,000 and 4,900,000 cells per cubic millimeter.

Reactions to the Wassermann and Kahn tests were negative. Hemolytic streptococci were revealed by cultures of material

specific tubercles or gummas. Giant cells have not been associated with thrombo-angiitis obliterans, rheumatic arteritis or polyarteritis nodosa.

It has been suggested that the etiology may be related to degenerative vascular changes occurring commonly in persons in this age group. The invariable presence of fever and inflammation and the self-limiting course of the disease point to the process of infection. An infection superimposed on arteriosclerosis may enhance the severity of the disease by permitting the occurrence of thrombosis more readily. Thus far bacteriologic investigation of removed portions of arteries has revealed nothing striking. In two instances *Streptococcus viridans* was recovered from the arteries.

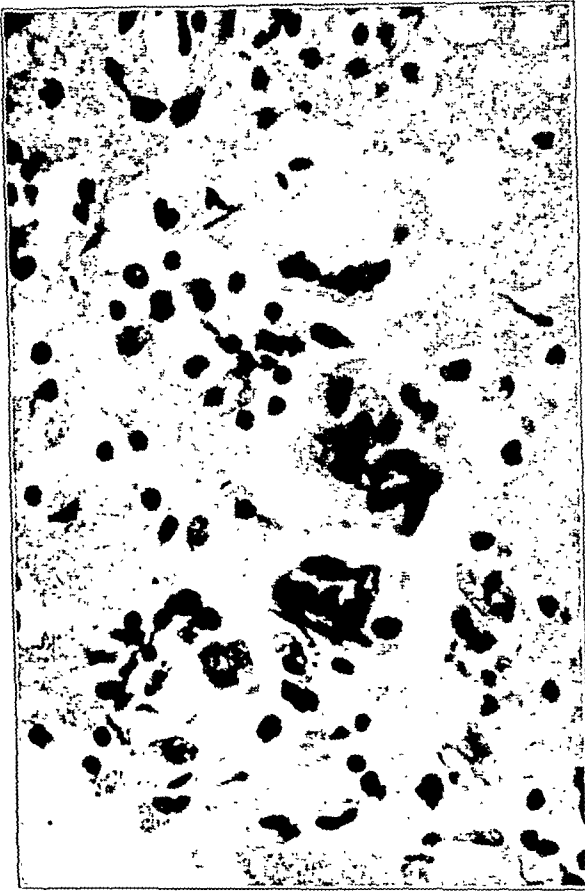


Fig. 3 (case 11).—Inflammatory reaction including giant cells in media. Reduced from a photomicrograph with a magnification of 1,050 diameters. (Hematoxylin-eosin stain.)

Some of the patients had infections of the respiratory tract preceding the vascular disease. The muscle and joint symptoms suggest that the disease may include a much wider distribution of tissues than the blood vessels of the head.

SUMMARY

Two cases of temporal arteritis are added to the eleven previously reported in the literature. The disease is a chronic inflammatory process involving the temporal arteries mainly with extension to other arteries of the scalp and face and sometimes to the retinas and the arms. It is a disease occurring chiefly in old people. It runs a self-limiting course, lasting usually several months. Giant cells are found characteristically as part of the inflammatory process. The etiology is unknown.

"SLOW EPINEPHRINE"

AN EXPERIENCE

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Since the advent of protamine zinc insulin several years ago, efforts have been increased, I believe, toward the preparation of drugs which would be, when injected subcutaneously or intramuscularly, like protamine zinc insulin, piecemeal in action, slow in action, safer in action, and more efficient in action because of these qualities. Thus, no doubt, when Keeney¹ published his preliminary report in 1938 on a "Slowly Absorbed Epinephrine Preparation" interest became more centered on epinephrine than before. Then a year later the same author² gave in detail his experiences with epinephrine in oil in twenty-four cases. The epinephrine in oil he used was a suspension of powdered epinephrine base in peanut oil, 1 cc. of the oil containing 2 mg. of epinephrine, or a 1:500 mixture. Ten patients who had had asthma, chronic in its manifestations, received relief from their symptoms of asthma for from eight to sixteen hours, while one patient received no prolonged effect from the doses that were indicated. Eleven others were treated during one or more acute paroxysms of asthma, remaining free from asthma for from nine to sixteen hours; one patient with urticaria and one patient with serum sickness secured evident relief from their symptoms for twelve hours. In comment as to the ill effects experienced from the drug, Keeney states that there may or may not be soreness, induration and swelling, with redness, at the points of injection and that frequent and consecutive injections may be irritating in the same fashion. However, the drug can be injected intramuscularly without producing a local reaction.

In one case, fifteen minutes after the administration of epinephrine in oil there was experienced palpitation and nervousness which endured for forty-five minutes; in another, headache, palpitation and nervousness of such a degree was produced that the drug was used no further; in a third case, within five minutes after the injection of epinephrine in oil, nervousness, palpitation and irregular cardiac action came on and lasted for sixty minutes. Because of the rapidity with which this picture was brought about it was thought that a part of the material, at least a part, had entered some small blood vessels during the injection.

Spain, Strauss and Fuchs³ have more recently reported on "A Slowly Absorbed Gelatin-Epinephrine Mixture," a 1:500 gelatin-epinephrine mixture used in fifty cases, deducing from the study of these that the 1:500 gelatin-epinephrine mixture was slowly absorbed, was nontoxic, and from its use marked clinical improvement often results; and also that there is a reduction in the number of doses required when the gelatin-epinephrine mixture is substituted for the regular solution of epinephrine. In one case this slow epinephrine produced an unbearable amount of nervousness, insomnia and later headaches, necessitating the discontinuance of the drug.

1. Keeney, E. L.: Slowly Absorbed Epinephrine Preparation: Preliminary Report, *Bull. Johns Hopkins Hosp.* 62: 227-229 (March) 1938.

2. Keeney, E. L.; Pierce, J. A. and Gay, L. N.: Epinephrine in Oil: New, Slowly Absorbed Epinephrine Preparation, *Arch. Int. Med.* 62: 119-142 (Jan.) 1939.

3. Spain, W. C.; Strauss, M. B., and Fuchs, A. M.: A Slowly Absorbed Gelatin-Epinephrine Mixture, *J. Allergy* 10: 209-214 (March) 1929.

The descriptive literature of epinephrine in oil states that this is a suspension of 2 mg. of powdered epinephrine crystals in 1 cc. of peanut oil and that the dose in adults is from 0.75 to 1.5 cc. to be given intramuscularly. Also that patients who are in need of epinephrine because of an acute paroxysm of asthma had best be given the selected dose of the 1:1,000 aqueous solution of epinephrine hydrochloride subcutaneously, followed with the indicated intramuscular injection of epinephrine in oil. It cautions against a larger dose than 1.5 cc. for adults and that it should not be given to the aged or to patients who have hypertension and the like.

REPORT OF CASE

Mrs. W. L. C., white, aged 22, a housewife, when seven months pregnant in the early part of 1938 experienced her first attack of asthma, which however lasted only twenty-four hours and responded for from two to three hours at a time to 2 to 3 minims (about 0.15 cc.) of the 1:1,000 aqueous solution of epinephrine hydrochloride. Soon after her baby was born at full term (this baby being now alive and well) she had her second attack, which lasted only two or three hours and required just two injections of epinephrine of from 2 to 3 minims each for relief.

June 4, 1939, or thereabouts she had her third attack of asthma, then again June 10 another attack, which lasted all night and was so severe by 11 o'clock the morning of June 11 that she called for help, and then she was given 5 minims (0.3 cc.) of epinephrine and 1 cc. of slow epinephrine in the right deltoid muscle. From this she quickly received relief from her wheezing and the asthmatic breathing but soon became extremely nervous, restless and shaking, with the feeling as if she were going to die. This continued on and increased in severity until I saw her at 11:35 a. m. That she was responding quite intensely to epinephrine was most evident for she had a deep pallor, she was restless and there were fibrillary twitchings of the muscles generally, especially of the arms and the upper part of the legs. Her expression was one of great fear. The respiratory rate was 30, the pulse rate irregular, at times not felt, counted around 160, but her heart tones were not booming and were not prominent. In fact, it was difficult beneath the rapid breathing rate to hear the heart tones clearly. In the abdomen, which was quite thin, an abdominal pulse was seen and easily palpated. At the moment it was not quite clear as to why this picture should have resulted from epinephrine unless she had been given a huge dose; she had been given, as stated, 5 minims of epinephrine subcutaneously and 1 cc. of slow epinephrine intramuscularly. The patient was lying in her bed at home, for she had not the strength to sit up or move about, and she had the feeling that if she were to move she would collapse.

Since the picture presented an emergency, I pulled loose one of the rubber tubes of a stethoscope and used it as a tourniquet above the belly of the right deltoid muscle, back of the area in which the epinephrine in oil had been injected, and we held this tourniquet tight. Within a minute or two the patient ceased her restlessness and the twitchings of the muscles were over with; the pulse rate decreased none in count, however, but became more regular and better felt. Likewise, the abdominal pulse was not so apparent. She was relaxed now and smiled. Then when it was felt that the tourniquet had been in place a time, lest it might cause damage to the arm or the fingers, it was released, and within a half minute there returned the restlessness, nervousness, twitchings, the irregularity of pulse and there was a deepening of the pallor and the appearance of anxiety. At the moment when I determined that the patient had had enough of this, I again used the tourniquet and the response was as before: a quieter patient, a better pulse, a lessening of the pallor.

The tourniquet was kept on for a while and off for a while until it seemed advisable to take her to the hospital, for I did not know how long it would take to get rid of the epinephrine in oil, and I knew that at the hospital there were measures that could be used to bring about a quicker recovery from this

trying experience. I accompanied the patient, therefore, to the hospital in an ambulance, holding the tourniquet in place and reaching the hospital at 12:20 p. m., where it was once again noted on release of the tourniquet at the moment when the fingers were becoming numb, perhaps hurting a little, that within a minute the muscular twitchings, restlessness, nervousness, pallor, anxiety and irregularity of pulse rate had all returned. When the patient had all she could stand of this, the tourniquet was reapplied, securing fairly quickly a calmer individual. At 12:27 a capsule of pentobarbital sodium was given and at 12:30 an intravenous injection of 5 per cent dextrose in saline solution was begun. At 12:50, in the midst of the epinephrine effect, the blood pressure was 110 systolic, 60 diastolic and the pulse rate irregular, from 140 to 150. At 12:53, after the tourniquet had been in place about two minutes, the pulse rate was 152 and the heart tones were normal except for the rapid rate. There was cyanosis generally, especially of the lips, fingernails and the palms of the hands. On the right arm where the tourniquet was being applied, and immediately on release of the tourniquet, the blood pressure was 100 systolic, 54 diastolic. Gradually, with the tourniquet being kept on for a while and off for a while, and with the effect of the pentobarbital sodium apparently coming into play, the patient closed her eyes and became somewhat drowsy. The epinephrine reaction became somewhat less severe, so that by 1:30 the tourniquet was taken off and left off. By 3:25 the pulse rate had dropped down to 120 and the respiratory rate to 20, the pallor had in marked degree disappeared and there were no contractions of the muscles. The patient at this hour was discharged; she walked out.

The next day, June 12, the patient's husband called on the telephone stating that his wife had supper the night before and slept all night, though at 1 o'clock in the morning she took a capsule of pentobarbital sodium. She was able to eat breakfast in the morning.

COMMENT

The question What has happened here? of course arises. The picture is one of responses, severe in manifestations, to epinephrine. Can a small blood vessel in a muscle be broken open by a needle or ruptured by oil dispersion and remain open for two hours so that it can take up the drug that is in its area? I doubt that this is true. Has the epinephrine base separated out of the oil and been pooled and thence absorbed in huge quantities and more quickly, and has water (in a wet syringe) or tissue juices (muscle) had anything to do with such effect? I'd rather think that the patient's tolerance to epinephrine was low. She is a thin, healthy looking person, not very tall, and has no stigmas of thyrotoxicosis.

Every effort has been made to describe this case without exaggeration. Because of the anxieties and fears, because of the unusual responses and the severity of responses, and because the patient was in a home, the case was truly one of emergency.

CONCLUSIONS

1. Slow epinephrine (epinephrine base in peanut oil) has been used in an acute paroxysm of asthma.
2. The severest of responses to overdosage of epinephrine resulted.
3. All cautions should be followed in the use of slow epinephrine.

204 North Third Street.

Still Seeking Truths.—Today, truths are still being sought out on the same lines as those which Harvey gave us. It would be a mistake to think that we have, even yet, reached a point that approaches finality in medicine, in surgery, or, indeed, in any of the sciences.—Robarts, H. H.: *If Health be Wanting*, Edinburgh M. J. 46:725 (Nov.) 1939.

EPINEPHRINE HYDROCHLORIDE IN
ACUTE PUERPERAL INVER-
SION OF UTERUS

REPORT OF THREE CASES

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Inversion of the uterus has been so well covered in the literature and standard textbooks on obstetrics and gynecology, particularly those by Curtis,¹ Irving,² Cooke,³ Williams,⁴ Graves⁵ and De Lee,⁶ that we shall attempt here only a brief summary of existing thought with special reference to management of acute puerperal cases. More particularly, we shall consider the use of epinephrine hydrochloride as an aid in reduction of the uterus to its normal position and report three additional cases in which this treatment was used.

Epinephrine hydrochloride has been particularly useful in prolonged labor with contraction ring as reported by Weiss,⁷ Rudolph and Ivy⁸ and others. The experimental and clinical work with the drug and studies on the physiology of uterine contraction by Rucker,⁹ Rudolph and Ivy,¹⁰ Rudolph¹¹ and Ivy, Hartman and Koff¹² are of great interest. De Lee¹³ expressed doubt whether this drug will relieve uterine spasm. The consensus indicates that epinephrine hydrochloride relaxes the uterine muscle, usually after one contraction, even in the presence of solution of posterior pituitary or ergotamine tartrate.

Having used this drug successfully many times with contraction rings, at the suggestion of Dr. J. E. Fitzgerald, of our staff, we decided on its use in acute inversion of the uterus as reported by Urner,¹⁴ hoping that the cervix would relax enough to make replacement of the corpus possible. In cases of inversion of the uterus, epinephrine has been used for treatment of the accompanying shock, we feel in insufficient doses to relax the uterus adequately. Its use in the treatment of shock probably precedes attempts to replace the uterus by too long an interval to be efficacious.

Inversion of the uterus is a relatively rare condition in which the uterus is turned inside out. The incidence varies considerably, being approximately one case in from 100,000 to 113,000 pregnancies, according to Findley's¹⁵ and Curtis's¹ reviews of the literature,

respectively. Irving² reported one case in 7,837 deliveries at Boston Lying-in Hospital and Maxwell¹⁶ one case in 6,500 deliveries at the University of California Hospital. Jacobs¹⁷ reported not a single occurrence in 250,000 cases at the St. Petersburg Lying-in Hospital, while Findley¹⁵ reported only one inversion in 280,000 cases at the Vienna Lying-in Hospital. Davis¹⁸ and others expressed the belief that it is occurring more frequently since the advent of solution of posterior pituitary. Curtis¹ stated that the incidence is roughly one case in 6,000 deliveries and that the regrettable circumstances surrounding some cases may account for their failure to appear in the literature. Kobak,¹⁹ in going over the Chicago Department of Health records, found seven deaths due to inversion of the uterus in 94,000 deliveries over a two year period; in five of the seven cases the condition was diagnosed at autopsy, being unrecognized before death. These, of course, were only autopsy statistics and do not include acute cases with survival, so that the condition is probably much more common than is generally recognized.

Inversion of the uterus may be classified in various ways. It may be puerperal or nonpuerperal, depending on whether it occurs incidentally to delivery or in conjunction with pedunculated submucous tumors. It may be complete or incomplete, depending on whether the fundus has passed through or is within the cervical ring; the complete variety is the most common in the literature, but many writers suggest that this may be true because incomplete inversion goes unrecognized. According to Cooke³ inversion may be spontaneous or traumatic, depending on etiology. According to Kellogg's²⁰ classification, it may be acute, subacute or chronic, the acute type having not over forty-eight hours' duration with a relaxed cervical ring, the subacute type having under thirty days' duration but with definite cervical constriction, and the chronic type being present for more than thirty days.

The cause is still unknown, although many theories have been advanced. Cooke³ stated that the traumatic variety is the most common and blamed traction on the cord with the uterus relaxed and improper attempts at placental expression. This view has also been held by Gordon,²¹ Milne,²² Browne²³ and others. Findley¹⁵ stated that no amount of force applied from above could invert a well contracted uterus and that the cord would rupture before traction from below would invert it. Irving² concluded from his review of the literature that probably in most cases inversion is spontaneous. According to Murphy,²⁴ Dudley²⁵ and Ashton,²⁶ the uterine musculature beneath the placenta is relaxed while the placenta is still intact; owing to the weight of the placenta the uterus becomes indented, and therefore with contraction of the surrounding muscle there is an attempt to expel it. Uterine inversion seems to be more commonly reported in primiparas, and in primiparas the placenta is a little more likely to be implanted in the

From the Department of Obstetrics of the Cook County Hospital.

1. Curtis, Arthur H.: *A Textbook of Gynecology*, ed. 3, Philadelphia, W. B. Saunders Company, 1938, pp. 520-523.

2. Irving, F. C., in Curtis, Arthur H.: *Obstetrics and Gynecology*, Philadelphia, W. B. Saunders Company, 1933, vol. 3, pp. 641-659.

3. Cooke, W. R., in Curtis, Arthur H.: *Obstetrics and Gynecology*, Philadelphia, W. B. Saunders Company, 1933, vol. 2, pp. 176-181.

4. Williams, J. W.: *Obstetrics*, New York, D. Appleton & Co., 1930, pp. 1015-1017.

5. Graves, W. P.: *Gynecology*, ed. 3, Philadelphia, W. B. Saunders Company, 1926, pp. 516-518.

6. De Lee, J. B.: *Principles and Practice of Obstetrics*, ed. 4, Philadelphia, W. B. Saunders Company, 1927, pp. 800-805.

7. Weiss, Julius: *Am. J. Obst. & Gynec.* **26**: 346 (Sept.) 1933.

8. Rudolph, Louis, and Ivy, A. C.: *Am. J. Obst. & Gynec.* **19**: 317 (March) 1930.

9. Rucker, M. P.: *Am. J. Obst. & Gynec.* **14**: 609 (Nov.) 1927.

10. Rudolph, Louis, and Ivy, A. C.: *Am. J. Obst. & Gynec.* **21**: 65 (Jan.) 1931; footnote 8.

11. Rudolph, Louis: *J. Obst. & Gynaec. Brit. Emp.* **42**: 992 (Dec.) 1935.

12. Ivy, A. C., Hartman, C. G., and Koff, Arthur: *Am. J. Obst. & Gynec.* **22**: 388 (Sept.) 1931.

13. De Lee, J. B.: *Principles and Practice of Obstetrics*, ed. 7, Philadelphia, W. B. Saunders Company, 1938, p. 899.

14. Urner, J. A.: *Am. J. Obst. & Gynec.* **25**: 131 (Jan.) 1933.

15. Findley, P.: *Am. J. Surg.* **5**: 453 (Nov.) 1927.

16. Maxwell, A. F.: *Surg. Clin. North America* **6**: 459 (April) 1926.

17. Jacobs, J. B.: *Am. J. Surg.* **32**: 130 (April) 1936.

18. Davis, G. H.: *Am. J. Obst. & Gynec.* **26**: 249 (Aug.) 1933.

19. Kobak, A. J.: Personal communication to the authors.

20. Kellogg, cited by Gordon, O. A., Jr.: *Am. J. Obst. & Gynec.* **32**: 399 (Sept.) 1936.

21. Gordon, O. A., Jr.: *Am. J. Obst. & Gynec.* **32**: 399 (Sept.) 1936.

22. Milne, J. M.: *Brit. M. J.* **1**: 220 (Jan. 30) 1927.

23. Browne, S. G.: *Brit. M. J.* **2**: 760 (Oct. 17) 1936.

24. Murphy, J. B., and Lynch, F. W., in Bryant, J. D., and Buck, A. H.: *American Practice of Surgery*, New York, William Wood & Co., 1911, vol. 3, p. 510.

25. Dudley, E. C.: *Principles and Practice of Gynecology*, ed. 5, Philadelphia, Lea & Febiger, 1908, p. 729.

26. Ashton, W. E.: *Practice of Gynecology*, ed. 3, Philadelphia, W. B. Saunders Company, 1906, p. 359.

fundus, according to Beckmann,²⁷ Vogel,²⁸ McCullagh²⁹ and Zangemeister,³⁰ although it is certainly not due to this fact in all cases because Holmes³¹ reported four cases and Thorn³² two cases in which it was a complication of placenta praevia. Irving² stated that the nonpuerperal type such as is produced by submucous fibroids is usually incomplete. Curtis¹ stated the opinion that the relaxed uterine supports usually present in these cases may have something to do with the etiology.

The pathologic condition is simply that the uterus is turned inside out; because of this the bladder, tubes and ovaries and ligaments are drawn down into the crater with marked traction on the ligaments. Some authors, notably Jolly³³ and Curtis,¹ have concluded that this is the cause of the profound shock, which is often out of all proportion to the amount of hemorrhage.

The symptoms and clinical picture are usually those of shock, with hemorrhage, possibly some pain, a tumor mass in the vagina or presenting at the vulva, and absence of the uterus from its usual position. The constricted cervical ring causes congestion with venous bleeding. There should be no trouble in making a diagnosis if the condition is kept in mind, although according to reports in the literature some appalling things have been done.

If there is disagreement in the literature as to the etiology of this condition, there seems to be almost uniform agreement as to the immediate treatment in acute cases. Curtis,¹ Irving,² Cooke,³ Williams⁴ and others have all urged that nothing radical be done before the shock is treated and that no attempt to replace the uterus be made until the patient is in better condition, except to place the uterus in the vagina and pack and apply a pad with pressure to help control hemorrhage. McCullagh²⁹ found that 30 per cent of the patients died when early attempts at replacement were made in the presence of shock and only 5 per cent when the shock was treated first. Irving² stated that this is proof enough, and Curtis¹ said that "it is dangerous to proceed when shock is present."

At this point in the treatment the road divides, and there is a diversity of opinion as to the best method of replacing the uterus. Cooke³ advised attempts at replacement with the patient under morphine or an anesthetic. He warned against use of solution of posterior pituitary, as it may make reduction difficult owing to the hardness of the uterus and after replacement it may initiate reinversion. He stated that if the uterus cannot be replaced it should probably be removed. Curtis¹ said that Huntington, Irving, Kellogg and Masson favor abdominal replacement. In our opinion there is no doubt that operative correction or hysterectomy is the procedure of choice in chronic cases; we feel that our efforts have been so successful that the treatment is certainly worth a trial in acute puerperal inversion.

REPORT OF CASES

CASE 1.—A white secundipara aged 24 entered the Cook County Hospital at 2 a. m. in the service of one of us (A. F. D.)

27. Beckmann, W.: Zur Aetiologie der Inversio uteri post partum. *Ztschr. f. Geburtsh. u. Gynäk.* 31: 371, 1894-1895.

28. Vogel, T.: Beitrag zur Lehr von Inversio uteri. *Ztschr. f. Geburtsh. u. Gynäk.* 42: 490, 1900.

29. McCullagh, W. McK. H.: Inversion of Uterus: Report on Three Cases and Analysis of 233 Recently Recorded Cases. *J. Obst. & Gynaec. Brit. Emp.* 32: 280, 1925.

30. Zangemeister, W.: Ueber puerperale Uterusinversion. *Deutsche med. Wchnschr.* 39: 729, 1913.

31. Holmes, R. W.: Inversio Uteri Complicating Placenta Praevia. *Obstetrics* 1: 297, 1899.

32. Thorn, W.: Zur Inversio uteri. *Samml. klin. Vortr.*, 1911, No. 625 (*Gynäk. No. 229*), p. 101.

33. Jolly, Weber: Inversio Uteri. *Ztschr. f. Geburtsh. u. Gynäk.* 76: 280, 1914.

in extreme shock, practically moribund and bleeding vaginally. The nurse's note on admission will give some idea of her desperate condition: "Pulse imperceptible, color blanched, air hunger, skin cold and clammy, pads saturated with blood, packing loose, patient restless but unresponsive, pupils dilated and oval." The resident's note stated that "on admission the patient was gasping, pulseless, ashen gray and cold, blood pressure was impossible to register." The note sent to the hospital with the patient by the physician who attended her during her confinement stated that she had "postnatal hemorrhage with a fibroid tumor of the uterus." The history of the delivery was obtained from the husband. The baby was born at home six hours before the patient's admission to the hospital. After a short wait the physician attempted a manual removal of the placenta. The afterbirth was attached to a tumor, from which it was peeled; the tumor was replaced. The patient continued to bleed; a prescription for fluidextract of ergot was left and the physician departed. Because the bleeding continued after several doses of the medicine, the physician was called back; he sent the patient to the hospital after packing the vagina.

On admission to the hospital, intravenous administration of 1,000 cc. of 2.5 per cent dextrose and 0.4 per cent saline solution was started immediately; because of the extremely precarious condition of the patient 500 cc. of group IV citrated blood was given intravenously from the blood bank with 500 cc. of 0.9 per cent saline solution, without cross matching. Shock therapy was instituted with administration of heat, 10 minims (0.6 cc.) of a 1:1,000 solution of epinephrine hydrochloride, 7½ grains (0.5 Gm.) of caffeine with sodium benzoate and another 1,000 cc. of 5 per cent dextrose given intravenously.

After two hours the patient began to rally, and the resident examined her because of marked bleeding through the pack. The pack was removed and the uterus found to be inverted and about 1 cm. within the introitus. There was considerable bleeding from many vessels over the entire surface of the uterus. The cervix was firm and tightly drawn over the inverted uterus. A gentle attempt at reduction failed, and it was thought inadvisable to do more until the patient was in better condition. The vagina was packed tightly; one-fourth grain (0.015 Gm.) of morphine sulfate was given and this medication repeated one and one-half hours later for restlessness. A second and a third intravenous injection of 500 cc. of citrated blood, each diluted with 500 cc. of 0.9 per cent saline solution, were given after cross matching was done, and another dose of 7½ grains of caffeine with sodium benzoate. At this time the pulse rate was 76 and the temperature 96.4 F.

About eight hours after admission to the hospital and about fourteen hours after delivery, after three transfusions and administration of 3,500 cc. of fluid, the patient was in fairly good condition. Ether anesthesia was started and the patient was prepared for vaginal examination. Fifteen minims (1 cc.) of a 1:1,000 solution of epinephrine hydrochloride was given; the fundus relaxed but the cervix remained tight, so the same amount of epinephrine was given in eight minutes. At this point relaxation of the cervix occurred with softening of the uterus. Reduction of the inverted uterus was easily accomplished. With the hand in the uterus, the operator (A. F. D.) could feel attempts of the organ to reinvert, so one ampule of ergonovine malate was given and another in seven minutes, after which an intra-uterine pack was placed. In about one hour and forty-five minutes the patient was awake and talking to her sister, in good condition and with a pulse rate of 108. The next morning the temperature had risen to 100.4 F. and the pulse rate to 92. After an ampule of solution of posterior pituitary had been given, the pack was slowly withdrawn and the posterior pituitary medication repeated. Administration of ergonovine malate ½ grain (0.0002 Gm.) three times a day and of sulfanilamide 15 grains four times daily was started because of the temperature. The red blood cell count after the third transfusion was 3,240,000 and the white cell count 27,700. After a fourth transfusion, the red cell count was 3,750,000. Because of moderate cyanosis, the sulfanilamide was discontinued. The temperature went as high as 102 F. and a foul lochia was present, but the patient was able to be discharged from the hospital on the fifteenth postpartum day.

About two weeks later she again was admitted because of vaginal bleeding and an upper respiratory infection. The temperature remained normal except for one reading of 99.4 F. Pelvic examination at this time showed that the cervix was soft and admitted one finger; the fundus was enlarged and seemed to have a greater transverse than longitudinal diameter.

CASE 2.—A private patient was seen in consultation by Dr. James Bloomfield,³⁴ one of the attending physicians at County Hospital. She was in shock, four hours after the inversion occurred and after the placenta had been peeled off. She was receiving intravenously physiologic solution of sodium chloride and a transfusion had just been started. Fifteen minims of a 1:1,000 solution of epinephrine hydrochloride was given, and this was repeated in fifteen minutes. Without any anesthetic and in the presence of shock the uterus and cervix relaxed and the fundus was easily replaced and packed. The patient was given tablets of ergonovine malate, $\frac{1}{320}$ grain three times a day for three days. After twenty-four hours part of the pack was removed, and in thirty-six hours the remainder was removed. Ten minutes after the uterus was replaced the patient, who had been in profound shock (the physician who called Dr. Bloomfield told him he didn't think she would be alive by the time he could get there), was sitting up talking to her friends. From his experience Dr. Bloomfield thinks that this method should be tried immediately, even in the presence of shock; if not successful, the shock should be treated and some operative procedure performed.

CASE 3.—A white secundipara aged 24, admitted to Cook County Hospital in the service of Dr. Alfred Kobak, had been sent to the antepartum clinic of the hospital by her private doctor because of high blood pressure and albumin in the urine, but she had had no toxic symptoms. Although, according to the menstrual date, delivery was due two days after she was seen in the clinic, the examining physician there thought she was only seven months pregnant. A rectal examination disclosed the head at the spines; after this the patient passed about an ounce of bright red blood without pain. She was sent into the hospital, where a sterile vaginal examination was made. No placenta was felt and the membranes were intact.

Two days later she went into labor and after five hours delivered her baby spontaneously. Ten minutes later the uterus had risen high up in the abdomen, the lower uterine segment was soft and the fundus was firm. The patient was instructed to bear down with pressure applied to the abdomen with the flat of the hand. The cord advanced and finally the placenta appeared at the vulva. Moderate pressure was exerted over the fundus and the placenta was expelled, but the membranes were adherent. The basin containing the placenta was gently moved up and down and the placenta-like tissue advanced. Because the placenta seemed large, an inversion was suspected and the resident was called. He confirmed the diagnosis. There was an accompanying hemorrhage of between 800 and 1,000 cc. The placenta had almost completely separated from the fundus at this time and the patient had gone into shock. No active bleeding followed the inversion. Shock therapy was instituted. External heat and $7\frac{1}{2}$ grains of caffeine with sodium benzoate were administered, and 1,000 cc. of physiologic solution of sodium chloride and 300 cc. of acacia solution (30 Gm. of acacia in 100 cc. of distilled water diluted with physiologic solution of sodium chloride to 300 cc.) were given intravenously until blood could be obtained. In the presence of shock, 10 minims of a 1:1,000 solution of epinephrine hydrochloride was given and the uterus was easily replaced after removal of the placenta. One ampule of solution of posterior pituitary and one ampule of ergonovine malate were given, and because the uterus contracted well only a vaginal pack was placed. A tear extending to the rectal mucosa was sutured. The first transfusion started caused a slight reaction and so was discontinued, but the patient was later given 1,000 cc. of citrated blood from the blood bank diluted with 1,000 cc. of physiologic solution of sodium chloride intravenously, and one fourth grain of morphine sulfate and $\frac{1}{320}$ grain of ergonovine malate every four hours for six doses. The patient's admission temperature was 99 F., pulse rate 96 and blood pressure 148 systolic, 94 diastolic. Seven hours post

partum the temperature was 101.6 F. and the pulse rate 152, but from that time the temperature rapidly fell to normal, although the pulse rate remained between 84 and 100. The patient was discharged on the eighth postpartum day in good condition. She had no foul lochia. The placenta was attached in the fundus.

COMMENT

After reviewing these three cases, we were all impressed by the ease with which reduction of the uterus was accomplished after the use of adequate doses of epinephrine hydrochloride, and we feel that 15 minim doses should be used and repeated if necessary.

In spite of the fact that these patients usually come out of shock soon after replacement of the uterus, one must still face the fact presented in the literature that six times as many die when treated during the shock. We are in complete accord with Dr. Bloomfield that if inversion should occur to one of our patients in labor we would immediately try replacement with the use of epinephrine hydrochloride; but we feel that, as most of these patients are brought into the hospital in shock, the shock probably should be treated first.

We feel that inversions of the uterus are real emergencies and that the help of every one in the service who can be spared is essential to good treatment. First morphine sulfate in one fourth or one half grain doses should be given, and then because a patient in shock is likely to have collapsed veins the intravenous fluids should be started, followed by transfusion as soon as suitable blood can be obtained. Next the patient should be kept warm and given stimulants, and the foot of the bed should be raised. The uterus should be placed in the vagina and the vagina packed to prevent hemorrhage as far as possible. The placenta should not be removed until replacement is attempted because this increases the blood loss. Enough blood and intravenous fluid, either physiologic solution of sodium chloride or 5 per cent dextrose, should be given to build up the patient's blood pressure. After the patient's condition is considered suitable, she should be prepared and draped on the table. The first 15 minim dose of a 1:1,000 solution of epinephrine hydrochloride should be given, then the placenta should be peeled off and, if the uterus and cervix relax, replacement attempted. If the uterus and cervix do not relax, the same amount of epinephrine should be given; we feel that, if this is done, attempts at replacement will usually meet with success.

We realize that it is very hazardous to transfuse without cross matching, but it was deemed necessary in the first case by those who were present.

Inversion of the uterus, particularly the acute puerperal type, is a formidable complication of labor. It may be spontaneous or may be induced by improper management of the third stage of labor. Because traction on the cord and improper attempts at expulsion of the placenta are common and the condition relatively uncommon, one wonders if this procedure is as important an etiologic factor as the literature would lead one to believe. The ease with which the fundus slipped through the cervix, particularly in the first case handled by one of us (A. F. D.), makes us wonder if this may not point to the cause, namely an unusually relaxed cervix and fundus. Inversion produces bleeding and profound shock usually out of proportion to the bleeding. If shock is present, the consensus is that it should be treated before attempts at replacement of the uterus are made. In the three cases presented epinephrine hydrochloride in adequate doses seemed to facilitate easy replacement of the uterus.

34. Bloomfield, James: Personal communication to the authors.

CONCLUSIONS

1. Acute inversion of the uterus is a rather rare but serious complication of labor.
2. If inversion occurs, it can probably be corrected immediately, before shock occurs, by adequate doses of epinephrine hydrochloride.
3. If shock is present, the shock should be treated before replacement is attempted.
4. Replacement is facilitated by adequate doses of epinephrine hydrochloride, namely 15 minims, repeated if necessary.

Clinical Notes, Suggestions and New Instruments

DEATH FROM AIR EMBOLISM FOLLOWING PERIRENAL INSUFFLATION

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The incidence of air embolism is not high, but it is a potential danger whenever air is injected into any organ or tissue of the body. The increasing popularity of perirenal insufflation as an aid in the diagnosis of tumors of the retroperitoneum makes pertinent a note of warning concerning the method.

The literature abounds with clinical reports of death from gas embolism following the introduction of air or oxygen into the urethra, bladder, uterus, pleura, peritoneum or blood stream. It would be paradoxical to assume that the retroperitoneal space is endowed with an invulnerability which these other structures do not enjoy. I cite a case from my own experience to attest the fact that this region is subject to the same hazard.

A white woman aged 38 entered the hospital complaining of a swelling in her right flank of four months' duration. On physical examination a smooth, extremely hard mass was palpated in the right upper quadrant of the abdomen. It moved with respiration and seemed to occupy the region of the right kidney, which could not be felt apart from it.

A bilateral pyelo-ureterogram (fig. 1) showed a normal left upper urinary tract. The right kidney was displaced downward and medially, the upper portion of the ureter coursing in front of the fourth and fifth lumbar vertebrae.

On the basis of the abdominal examination and pyelographic studies a clinical diagnosis of retroperitoneal tumor was considered likely. In order to be more certain of the location of the mass, however, it was decided to perform a perirenal insufflation. This procedure was carried out in the manner described by Cahill.¹ A blunt spinal puncture needle was introduced below the midpoint of the rather long twelfth rib and advanced until the usual "jump" was felt as the end pierced the transversalis fascia. Following removal of the stylet no blood escaped from the needle and none could be aspirated when a syringe was attached. With the aid of a two way valve, 200 cc. of filtered air was slowly injected. Although no manometric check was made on the pressure, no excessive force was exerted.

The patient remained perfectly rational during the injection, but two or three minutes later her body suddenly became rigid and extended in the opisthotonos position. There was an immediate loss of consciousness and control of the sphincters. Her color became cyanotic, the vessels of her neck were dilated and the respirations were labored and irregular. The pulse was thready and the heart sounds were barely audible. No bruit suggestive of air in the chambers of the heart was heard. The blood pressure reading could not be obtained. The eyes were deviated to the right; the pupils were small and contracted and did not react to light. The tendon reflexes were normal.

One hour later the patient regained consciousness. She complained of complete blindness and tingling all over her body. The tendon reflexes were still normal and no sensory changes could be made out. Her vision gradually returned in the course of a few hours.

Six hours after the injection, roentgenograms of the chest and abdomen were taken. The film of the abdomen showed a poor localization of the air, although its presence within the perirenal space was clearly demonstrated (fig. 2). No evidence of the injected air was seen in the film of the chest; there was no pneumothorax and no air in the mediastinum or beneath either cupola of the diaphragm.

For twelve hours after the injection the condition of the patient seemed to improve, but thereafter she became irrational and increasingly restless, despite large doses of opiates. She died twenty-one hours after the perirenal insufflation. The pulse rate had risen to 180 and the temperature reached 102.4 F. just before death.

A necropsy was performed by Dr. Nathan Rudo. Abstracts from the report of the examination follow:

No hemorrhage was found along the path of the injection. There was no gross evidence of injury to any blood vessel, the liver or the right kidney; the kidney was displaced downward and medially by a tremendous enlargement of the liver. No sign of the injected air was found at any point.

The heart, lungs and brain were grossly normal. At the junction of the cecum and ascending colon there was an ulcerated tumor which almost completely encircled the lumen. The liver was riddled with huge masses of tumor tissue, many of which had undergone central cystic degeneration.

Microscopic sections of the brain, lungs and kidneys showed antemortem clots obstructing many of the smaller arteries, veins and capillaries (fig. 3A). In some areas perivascular hemorrhage was also seen (fig. 3B). The primary tumor, as well as the metastatic implants, was typical of adenocarcinoma of the cecum.



Fig. 1.—Bilateral pyelo-ureterogram showing the right kidney displaced downward and medially. An apparent filling defect is seen to resolve in the oblique lateral view (inset). The deformity suggested by the anteroposterior view is produced by horizontal renal torsion, the kidney being rotated on its transverse axis with the upper pole in a dorsal position.

COMMENT

The patient's clinical course assured the diagnosis of air embolism. The cerebral manifestations localized the lesions to the brain and precluded a purely circulatory failure or air emboli of the coronary vessels.

It is interesting to speculate on the route taken by the air in entering the blood stream. The roentgenographic evidence demonstrated that the air originally entered the perirenal space and that it did not penetrate the pleural cavity, the peritoneal

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1. Cahill, G. F.: Air Injections to Demonstrate Adrenals by X-Ray. *J. Urol.* 34: 238 (Sept.) 1935.

cavity or the mediastinum. From the perirenal space it may have found its way into one of the friable veins which are so numerous in the fatty tissue surrounding the kidney; it may have dissected along the vascular pedicle or renal pelvis to gain entrance into a branch emptying into the renal vein close to its origin or to invade the vascular parenchyma through the sinus renalis. The possibility must be considered also that, in



Fig. 2.—Area of the right kidney six hours after perirenal insufflation. Although the air is still poorly localized, its position within the perirenal space is clearly demonstrated by a dark crescentic shadow which outlines the lateral and inferior borders of the displaced right kidney, as indicated by the arrows.

addition to a primary invasion, the air may have entered the venous system by way of the cisterna chyli and thoracic duct.

Regardless of the route taken, it is evident that the communication must have been extremely small or some gross hemorrhage would have been apparent. In this connection the recent experimental studies of Villaret² and his co-workers are illuminating because they indicate that the size of an embolus is of far less importance in causing death than is generally believed.

As Mathé³ has emphasized, air is more likely to enter the circulation in the presence of any injury or disease of the adjacent blood vessels. It only increases the risk of an already dangerous procedure, therefore, to drive the point of the needle into the cortex of the kidney as a step in injecting the perirenal space, as recommended by Gianturco and Drenckhahn,⁴ or to have the patient perform rowing exercises after the injection in order to work the air around the kidney, as advised by Mencher.⁵

If it were possible to introduce air into the body at a pressure lower than that in the veins which lie in the vicinity, the procedure should be harmless enough. Unfortunately the normal venous pressure is little higher than the atmospheric pressure (15 mm. of mercury in the venules, falling to 5 mm. in the larger veins, according to Eyster⁶), and, as the vena cava is reached, the venous pressure becomes negative in respect to the atmospheric pressure, although it is positive as compared to the intrathoracic pressure. Since air occasionally penetrates the mediastinum during injection, this relationship bears directly

on the problem of perirenal insufflation. Gianturco and Drenckhahn⁴ recommended injection at a pressure not exceeding 3 cm. of mercury, yet this is 15 mm. greater than the pressure in the venules and 25 mm. higher than that in the larger veins. In spite of the fact that the lowest pressure at which air can be injected into the perirenal space does not completely eliminate the danger of air embolism, it is nevertheless a matter of considerable importance to make the injection under as low a pressure as possible.

There is no agreement as to the mechanism of death from air embolism. In cases of massive embolism it is generally conceded that mechanical obstruction of the circulation or pulmonary suffocation may be regarded as constituting the essential factor. In smaller embolisms the immediate cause of death is not so easily explained. Carr⁷ recently brought forward the revolutionary idea that the formation of thrombi rather than the gas alone causes the damage. He observed antemortem intravascular clotting and perivascular hemorrhage (as seen in the case reported) in the organs of experimental animals and human beings following the injection of air intravenously. Death resulted from these changes and not from true air emboli.

CONCLUSION

The danger of death from air embolism renders perirenal insufflation a hazardous procedure. If utilized at all, this diagnostic aid should be reserved for that small group of patients for whom the observations made by its use may prove of extraordinary value. In order to reduce the danger to a minimum, care should be exercised to avoid traumatization of the surface of the kidney and the tissues injected, and the injection should be carried out under as low a pressure as possible. Any damage to a vein, even though the vessel is of small dimensions, is a potential site for the entrance of air.

Should an unidentified mass cause a displacement of the kidney a great deal may be learned concerning its location by pyelography and a proper interpretation of the torsion which is present.⁸ As concerns the detection of less pronounced enlargements, such as small tumors of the adrenal gland, perirenal insufflation has in my experience yielded equivocal results.

If, after exhausting the innocuous diagnostic methods at one's disposal, further study of the retroperitoneum is indicated, it seems to me that exploratory operation is more desirable than perirenal insufflation. While perhaps carrying a slightly higher risk, open operation assures an accurate diagnosis and affords



Fig. 3.—Section of the brain following death from air embolism: A, antemortem clot occluding a capillary (high power); B, area of perivascular hemorrhage surrounding a small artery and vein (low power).

the immediate opportunity for the performance of any curative operation which is found to be indicated. The simultaneous exposure of both adrenal glands, according to Young's⁹ technic, adds little to the risk of a unilateral procedure and has much to recommend it when confusion exists as to which gland should be explored.

7. Carr, J. L.: Personal communication to the author.

8. Weyrauch, H. M., Jr.: The Significance of Renal Torsion in the Diagnosis of Retroperitoneal Tumors: Use of the Lateral Pyelogram. *J. Urol.* 41: 877-892 (June) 1939.

9. Young, H. H.: A Technic for Simultaneous Exposure and Operation on the Adrenals. *Surg., Gynec. & Obst.* 63: 179 (Aug.) 1936.

2. A Symposium on Pulmonary Embolism, Paris letter, J. A. M. A. 112: 865 (March 4) 1939.

3. Mathé, C. P.: Fatal Embolism Due to Inflation of Bladder with Air. *Surg., Gynec. & Obst.* 48: 429-436 (March) 1929.

4. Gianturco, C., and Drenckhahn, C. H.: The Role of Perirenal Injection of Gas in the Radiological Study of the Adrenal Glands. *Radiology* 20: 500 (April) 1938.

5. Mencher, W. H.: Perirenal Insufflation. *J. A. M. A.* 109: 1338 (Oct. 23) 1937.

6. Eyster, J. A. E.: *The Clinical Aspects of Venous Pressure*, New York, Macmillan Company, 1929, p. 2.

BLINDNESS DUE TO AIR EMBOLISM: A COMPLICATION OF EXTRAPLEURAL PNEUMOLYSIS

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Our purpose in this report is to draw attention to the occurrence of an air embolus in the eye and to record two cases in which this was observed as a complication of extrapleural pneumolysis.

REPORT OF CASES

CASE 1.—History.—F. C., a Negro woman aged 27, was admitted to the Baltimore City Hospital in August 1936. A diagnosis of pulmonary tuberculosis was made and treatment with pneumothorax was instituted. In February 1937, because of unsatisfactory collapse, this therapy was discontinued. Nov. 11, 1938, a first stage thoracoplasty was performed. The first, second and third ribs on the left side were resected and an extrapleural apicolysis was done. Following this procedure pneumothorax treatment was resumed.

December 15, 120 cc. of air at a pressure of 220 mm. of water was injected. Immediately after this procedure the patient complained of excruciating pain in the head and within a few moments exclaimed that she could not see. She became nauseated and vomited. The pupils were constricted. She feared approaching death. She rapidly became disoriented. A sedative (one-fourth grain [0.016 Gm.] of morphine) served partially to control her restlessness. She passed gradually from a state of confusion into coma, interrupted by generalized convulsions, which occurred many times a day for three days. Improvement then ensued and by the fifth day she was well oriented and was able to feed herself. Results of general and neurologic examinations were negative except for those of the ocular examination.

Examination of the Eyes.—The ocular fundi were not examined during the early hours of this attack. At the onset the pupils were constricted and failed to react to light. Ophthalmoscopic examination was made twelve hours after onset of the illness and was reported as negative. A cycloplegic had been used and this eliminated further observations on the motility of the pupil. There were no apparent extra-ocular palsies at any time. Eighteen hours after the onset there was a low grade retinal edema, most pronounced in the maculae. This edema persisted for one day. The nerve head and vessels appeared normal. The patient did not perceive light. On the fourth day vision was limited to hand motion with either eye, and on the fifth day, after further improvement, the visual acuity was 20/200. Field defects, if present, were not discovered. At examination on the fifth day the only remaining defect was impairment of vision. Visual acuity steadily improved thereafter, so that within nine days after the accident the vision was 20/15 in both eyes and she could read small print with ease.

CASE 2.—History.—R. D., a Negro youth aged 20, was seen at the Johns Hopkins Hospital in July 1937, at which time a diagnosis of pulmonary tuberculosis was made. He was admitted to the state sanatorium, where he remained for one year. His condition became progressively worse and in April 1939 he was admitted to the Johns Hopkins Hospital for surgical intervention. April 15 a left-sided extrapleural pneumolysis was done. The following day 500 cc. of air was injected. Two hours later the patient suddenly complained that he could not see, and a complete motor paralysis of all four extremities was found. He rapidly became disoriented and feared approaching death. At the onset the respirations became shallow; the pulse rate increased and he was nauseated and vomited. He was placed in an oxygen tent and given morphine for sedation. Later in the evening occasional spasmodic contractions of the left leg were observed. The paralysis on the right disappeared by the following morning, but for four days clonic contractions persisted in the left leg. On the sixth day the patient was able to move and use the left arm, but the left leg remained paralyzed. He became com-

pletely oriented and gradual improvement continued, but on the twelfth postoperative day a bronchocutaneous fistula and signs of sepsis developed. Following this the course was steadily downhill. He died three weeks later. Autopsy was not obtained.

Examination of the Eyes.—Examination was recorded two hours after the onset of the accident. The pupils were dilated and fixed to light. The retinas were extremely pale, but the state of the vessels was not described. Four hours later the pallor of the retinas had disappeared and the vessels were normal. The pupils remained dilated. The patient appeared to be completely blind. The extra-ocular movements were observed to be normal during brief periods when the patient cooperated. This situation persisted for three days, and on the fourth day he was able to perceive light with either eye and there was a return of pupillary constriction on exposure to light. On the fifth day visual acuity was equal to hand motion. Gradual improvement continued thereafter, and within two weeks vision had become 20/20 and Jaeger I in both eyes. The eyes remained normal.

COMMENT

From a review of the literature and on the basis of the two cases herein reported we have attempted to summarize the important facts regarding air embolism as it affects the eyes.

Mechanism.—The mechanism¹ of air embolism is not entirely clear. It would seem that prerequisites for the occurrence of air embolism are (1) open or wounded veins, (2) available air and (3) either pressure on the available air so that it is forced into the veins or a negative pressure within the veins so that the air is pulled into them. If veins are cut across, they cannot readily collapse when they are suspended in fibrous tissue. Pulsating arteries adjacent to these veins may contribute a negative pressure within the veins, so that a wound within the vessel becomes a veritable suction valve. In human beings² the amount of air necessary to cause symptoms is not known. Accidental introduction of air into the veins rarely results in untoward symptoms.

Experimental injections of air into the carotid artery of dogs have been reported by Wever³ as resulting in the immediate pallor of the retinas, engorgement of the veins and generalized convulsions; within five minutes after the injection of air the retinas may again be normal. We have injected air into the carotid artery of an anesthetized dog. Immediately after this injection air appeared in the retinal arteries. With the ophthalmoscope the picture was striking. Glistening rods were seen irregularly placed in the arteries and were most clearly visible at the point of arterial branching. This characteristic picture was transitory and had disappeared within less than one minute. There was some engorgement of the veins and questionable narrowing of the arteries. There was definite pallor of the retinas.

Symptomatology.—The occurrence of symptoms usually follows immediately after the injection of air, but in some instances there may be a lapse of several hours between the injection of air and the onset of symptoms. Case 1 exemplifies immediate occurrence of symptoms, whereas case 2 exemplifies delayed occurrence. Probably the delay in the onset of symptoms in case 2 was due to delay in entrance of air into the vessels.

The symptoms may be described as follows: The patient complains immediately of severe pains in the head, dizziness, nausea and vomiting. In some instances there may be blindness. Fear of impending death is a prominent symptom. The pulse becomes rapid and the breathing shallow and labored. There may be general or localized convulsions. Extensive paralysis may develop. Death may ensue within a few minutes. If, however, death does not occur within the first half hour the prognosis is relatively good. Permanent defects of vision as a result of an air embolus have not been recorded. Hamilton and Rothstein⁴ described cases similar to those here reported. Pronounced improvement of paralysis may be con-

Dr. John T. King Jr. and Dr. William Rienhoff Jr. gave us the privilege of reporting these cases.

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1. Schlaepfer, Karl: Air Embolism Following Various Diagnostic or Therapeutic Procedures. *Bull. Johns Hopkins Hosp.* 33: 321 (Sept.) 1922.

2. Richardson H. F.; Coley, B. C., and Hall, G. E.: Experimental Air Embolism. *Canad. M. A. J.* 36: 584 (June) 1937.

3. Wever, E.: Cerebrale Luftembolie. *Beitr. z. Klin. d. Tuberk.* 31: 159, 1914.

4. Hamilton, C. E., and Rothstein, Emil: Air Embolism. *J. A. M. A.* 104: 2226 (June 22) 1935.

firmly expected even in severe cases.⁵ In case 1 herein reported recovery was complete; in case 2 there was pronounced recovery but some degree of paralysis remained.

When the eyes are involved, blindness is an early symptom. Because of their transitory nature definite ocular signs, as observed in animals, are rarely seen in human beings. Retinal edema, such as was observed in case 1, may be of such mild degree that it may easily be overlooked. In severe cases blindness may persist for several days, as in our two cases. The pupils may be either dilated or constricted. Paralysis of the extraocular muscles were not seen in our cases but have been reported; conjugate deviation of the eyes has been recorded.⁶ Field defects not apparent in our cases have been reported by others. Barkan⁷ has recorded homonymous quadrantic defects and homonymous hemianopia which disappeared within two weeks.

CONCLUSIONS

Two cases of air embolism as a complication of extrapleural pneumolysis were observed. Both patients were blind for a period of three days. Improvement of vision was gradual and within two weeks it had become completely normal.

The appearance of air in the retinal vessels is a pathognomonic sign of air embolism, but this sign is so transitory that it is rarely seen. Blindness is the most important ocular sign. The prognosis for return of vision is good for patients who survive.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

THE TREATMENT OF DEHYDRATION, ACIDOSIS AND ALKALOSIS

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NEW HAVEN, CONN.

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Under various circumstances a syndrome called dehydration develops. The patient shows diminished turgor of the skin, sunken eyes, poor circulation, oliguria and concentration of the blood with respect to red cells and serum proteins. While an inadequate intake of water will produce some of these symptoms, the fully developed picture occurs almost exclusively when, as a result of vomiting, diarrhea, sweating or abnormal diuresis, the body has lost extracellular electrolyte (salts) as well as water. Furthermore, this fully developed picture of dehydration can be produced when extracellular electrolyte is no longer available to the body as a whole because it has been fixed in the inflammatory exudate of a burn. In dehydration the evidences of loss of fluid volume are confined chiefly to

extracellular fluids. The central feature is the deficiency of extracellular electrolyte, since dehydration can develop either with or without loss of water from the body as a whole.

In order to explain the treatment of dehydration, the factors controlling the distribution of body water will be briefly described.¹ About seven tenths of the body weight is represented by water, which is distributed in two physiologic compartments. The water outside the cells constitutes about 25 per cent of the body weight in adults and about 35 per cent in newborn babies; the water inside the cells makes up about 50 per cent of the body weight. Although cellular membranes separate these two compartments, the water is free to move between the two in response to osmotic forces. Since the effective osmotic pressure of these two compartments is largely due to potassium in the case of intracellular water and to sodium in the case of extracellular water, the distribution of these two univalent bases is the chief factor controlling the distribution of body water.

The characteristic feature of extracellular fluids is that they contain large amounts of bicarbonate, chloride and sodium and but small amounts of magnesium, phosphate and potassium. Blood plasma, lymph, interstitial fluid and cerebrospinal fluid are the chief examples of extracellular fluid. Since these fluids are in free communication with blood plasma through the capillary membranes, they resemble one another closely except in their protein concentration. The intestinal secretions, gastric juice and bile may be considered modified extracellular fluids which are normally reabsorbed. Furthermore, sweat resembles extracellular fluid, and urine is a highly modified capillary ultrafiltrate of plasma which is excreted in order to preserve the composition of all body fluids. Not only are the extracellular fluids the cellular environment which must be kept fairly constant by renal activity but they are the vehicle for carrying nutrition to the cells, the means of taking waste products away from the cells, the source of digestive fluids and the source of urine. It is not surprising, therefore, that disturbances of these fluids affect all parts of the body.

The fluid within the cells contains almost exclusively potassium and magnesium as basic ions, and proteins and organic phosphate as acid ions. Although the amount and concentration of potassium, magnesium, phosphate and protein within the cells are known to vary, actual analyses of tissues of animals have demonstrated that the relation of the amounts of these substances to one another is surprisingly constant. This constant relationship between the principal constituents of cells can be shown to persist in starvation, in fever, in thirst and after loss of extracellular electrolyte. Although variations in the water content of cells can frequently be demonstrated, these changes can usually be accounted for by changes in the concentration of sodium in extracellular fluid. Thus, although cellular constituents (phosphate and potassium) undoubtedly cross cellular membranes in response to nutritional or functional needs of the cells, the osmotic equilibrium in response to changes in concentration of sodium in extracellular fluid is attained principally by shifts of water.

5. Lillington, C.: Gas Embolism and Other Accidents of Chest Puncture, *Tubercle* 4: 193 (Feb.) 1923.
6. Walker, V. R.: Air Embolism During Artificial Pneumothorax, *Lancet* 1: 636 (March 25) 1933.

7. Barkan, Hans: Air Embolism, *Tr. Am. Ophth. Soc.* 25: 224, 1927. From the Department of Pediatrics, Yale University School of Medicine.

The term dehydration is retained because it is the one in general use and is no more objectionable than the other terms proposed, namely exsiccosis, anhydremia and hypohydration. Deficiency of extracellular water and electrolyte fits present concepts well but for obvious reasons will never be accepted as a name for a common condition. Acidosis and alkalosis are discussed only as far as they are manifestations of dehydration.

1. Harrison, H. E.; Darrow, D. C., and Yannet, Herman: *The Total Electrolyte Content of Animals and Its Probable Relation to Distribution of Body Water*, *J. Biol. Chem.* 112: 515 (March) 1936. Gamble, J. L.: *Extracellular Fluid*, *Bull. Johns Hopkins Hosp.* 61: 151, 174 (Sept.) 1937. Peters, J. P.: *Body Water*, Baltimore, C. C. Thomas, Publishers, 1935. Darrow and Yannet.²

and the composition² of cytoplasm is not subject to great changes brought about by osmotic forces outside the cells.

In addition to protecting the composition of the cells, the type of osmotic equilibrium existing between intracellular and extracellular fluids explains why the volume of extracellular fluid cannot be maintained without normal amounts of sodium and chloride even if the total body water remains unchanged. To illustrate the point, one may conceive that a loss of sodium chloride from the body occurred without change in body water. This would reduce the osmotic pressure of extracellular fluids. However, since the intracellular fluids lose no electrolyte in response to this decrease in extracellular electrolyte, the osmotic pressure within the cells must attract water from the extracellular fluids. The shift of water will bring about osmotic equilibrium, but intracellular water will be increased while extracellular water will be decreased. This reaction is readily demonstrated in animals³ and is accompanied by all the symptoms and signs of clinical dehydration. Observations on patients lead to the same conclusion. For instance, in certain patients with low concentration of sodium in serum all the symptoms and signs of dehydration develop. After treatment with physiologic solution of sodium chloride all these signs and symptoms disappear and serum concentrations return to normal. Since no gain in weight occurs, no change in body water has taken place during the obvious recovery of extracellular volume. Consequently one may conclude that the retention of sodium chloride made it possible to increase the volume of extracellular fluids by attracting water from the cells. Similar states of decreased volume of extracellular fluids and increased volume of intracellular fluids in both man⁴ and animals⁵ can be shown to persist for days if no sodium chloride is given. The observations demonstrate the importance of the content of extracellular electrolyte for the distribution of body water and the futility of treatment of dehydration by water and dextrose solutions alone.

Changes in the electrolyte pattern (or acid-base equilibrium) of the serum are frequent accompaniments of loss of extracellular water and electrolyte. If the loss of sodium is greater than the loss of chloride, relatively less than the normal amount of sodium is available to form bicarbonate. This condition results in acidosis. In alkalosis more than the normal concentration of bicarbonate is found in serum as a result of the relatively greater loss of chloride than sodium. Through the study of the composition of gastric juice, pancreatic juice, bile, diarrheal stools, urine and sweat, the various types of loss of extracellular electrolyte can be characterized as to their effect on acid-base equilibrium. In this sense most cases of acidosis and alkalosis may be regarded as special manifestations of deficit of extracellular electrolyte.

During deficiency of extracellular water and electrolyte a number of disturbances in renal function develop.⁶ Thus when water is drunk during dehydration it is excreted more slowly than is normal despite a low concentration of sodium and chloride. When small deficits of sodium exist, the kidneys may eventually restore serum concentrations by excreting extracellular water. However, if large deficits of sodium persist for days, the concentrations of the serum remain low because the kidneys do not diminish the volume of extracellular fluid in order to preserve concentrations. Retentions of urea are explained by the reduction in glomerular filtrate. Moreover, when large deficiencies of sodium and chloride are present the kidneys fail to adjust the acid-base equilibrium of the blood, i.e. they fail to excrete the relative excess of chloride in acidosis and the relative excess of sodium in alkalosis. The explanation of these anomalies is not clear; in part they are brought about by the circulatory failure of dehydration, but in part they are probably dependent on the fact that the function of renal tubules is best carried out when serum concentrations are normal. These points are important, for they disclose that sodium chloride as well as water is necessary for restoration of renal function in dehydration.

Considerable quantities of potassium, phosphate and nitrogen are excreted at the time of the loss of sodium and chloride during the development of dehydration. While the interpretation of the losses of cellular constituents cannot be given with certainty, the losses tend to occur in such proportions as to indicate that cellular structures are breaking down as a whole. Furthermore, tissue analyses indicate that the cellular constituents have surprisingly constant relationships to one another. I believe that the losses of cellular constituents are the result of destruction or of utilization of cellular structures. Hence the decreases in amount of cellular water in the body are not the result of a specific deficiency of potassium, which, if replaced, would restore cellular water. From a therapeutic point of view the restoration of cellular water and electrolyte is not a simple process of providing water, magnesium, phosphate and potassium but a problem in nutrition which can be treated only with food.

It must be kept in mind that all types of marked dehydration are accompanied by the essential features of shock. By shock one refers particularly to the inability of the body to maintain the blood circulation and blood pressure, not primarily because of cardiac failure but rather because of decreases in the volume of circulating fluids and dysfunction of the capillaries.⁷ Sometimes the disturbance is the result of loss of plasma proteins, which may be caused by hemorrhage or by localization of plasma at the site of a traumatic injury or at the site of a burn. However, loss of extracellular electrolyte alone can produce decreased plasma volume. Although plasma volume is maintained for a time at the expense of interstitial fluids, continued loss of extracellular electrolyte leads to diminished plasma volume. Part of the picture of vascular collapse is thought to be dependent on arteriolar constriction,⁸ which, although it preserves the circulation to the brain, aggravates the deficiency in circulation elsewhere. If the plasma volume, blood pressure and circulation remain insuffi-

2. Harrison, H. E., and Darrow, D. C.: The Distribution of Body Water and Electrolyte in Adrenal Insufficiency, *J. Clin. Investigation* **17**: 77 (Jan.) 1938. Yannet, Herman, and Darrow, D. C.: The Effect of Hyperthermia on the Distribution of Body Water and Electrolytes in Brain, Muscle and Liver, *ibid.* **17**: 87 (Jan.) 1938. The disturbances in concentration of muscle potassium in cases of adrenocortical insufficiency and of all cellular constituents of the brain in cases of hyperthermia are not to be regarded as responses to osmotic forces but rather as cellular injury or altered cellular activity.

3. Darrow, D. C., and Yannet, Herman: The Changes in the Distribution of Body Water Accompanying Increase and Decrease in Extracellular Electrolyte, *J. Clin. Investigation* **14**: 266 (March) 1935.

4. McCance, R. A.: Experimental Sodium Chloride Deficiency in Man, *Proc. Roy. Soc. London, s.B.* **119**: 245, 1932.

5. Darrow, D. C., and Yannet, Herman: Metabolic Studies of the Changes in Body Electrolytes and Distribution of Body Water Induced Experimentally by Deficit of Extracellular Electrolyte, *J. Clin. Investigation* **15**: 419 (July) 1936.

6. McCance, R. A., and Widdowson, E. M.: The Excretion of Urea in Man During Experimental Salt Deficiency, *J. Physiol.* **91**: 222 (Nov. 26) 1937.

7. Blalock, Alfred: Acute Circulatory Failure as Exemplified by Shock and Hemorrhage, *Surg., Gynec. & Obst.* **58**: 551 (March) 1934.

8. Freeman, N. E.: Hemorrhage in Relation to Shock, *Ann. Surg.* **101**: 424 (Jan.) 1935.

cient for a few hours, secondary changes take place leading to dilatation of the capillaries and leakage of serum proteins into tissue spaces. These features of shock may be prevented by blood (or plasma) transfusions and are sometimes corrected by the same means. However, if severe shock is allowed to persist several hours, no effective therapy is available.

From the foregoing outline of the nature of the disturbances in dehydration, the general aims of treatment of all types are as follows: (1) restoration of sodium chloride along with sufficient water to enable the kidneys to adjust extracellular volumes and concentrations; (2) adjustment of acid-base equilibrium in certain cases of acidosis; (3) treatment of shock. Hypodermoclyses and intravenous infusions of physiologic solution of sodium chloride (or its modifications) are the most reliable means of replacing extracellular water and electrolyte. Intravenous infusions of sodium bicarbonate or sodium lactate are the means of treating acidosis when the saline solutions are inadequate. Although infusions of dextrose temporarily ameliorate various types of shock, the chief reliance must be placed on blood or plasma transfusions.

Although a great deal of sodium chloride can and should be given by mouth to many patients, the various forms of parenteral therapy must be the chief measures used in cases of severe dehydration. This procedure is made necessary not only by the need for quick effects but also by the amounts of the various solutions required. Furthermore, dehydration per se leads to nausea and vomiting, and many of the patients have nausea and vomiting as a cause of the illness. If nausea and vomiting are present, nothing should be given by mouth, since water or food that is vomited not only does no good but does harm by increasing the loss of electrolyte. The same untoward result may be brought about by food, and less often by water, when these aggravate a watery diarrhea. It cannot be emphasized too often that nothing should be done to increase the loss of electrolyte.

The treatment of dehydration is usually carried out first by a hypodermoclysis of physiologic solution of sodium chloride (from 10 to 60 cc. per kilogram of body weight) and an infusion (from 5 to 30 cc. per kilogram) or 5 or 10 per cent dextrose while the blood is being matched for a transfusion. If symptoms of shock are present, a blood transfusion of from 10 to 30 cc. per kilogram of body weight is given as soon as possible. The higher figure is used only in the most severe cases. Patients suffering from massive hemorrhage with dehydration are probably the only adult patients who require maximal amounts of blood, but many babies with severe dehydration require large transfusions. Since it is not possible always to predict which patients with severe dehydration will recover from circulatory collapse when extracellular water and electrolyte have been restored, many patients should be given transfusions who might otherwise recover with saline and dextrose solutions alone. Since hemoconcentration^{8a} may be brought about by shock alone, a high red count is not a contraindication to transfusion. Recent work has shown that the increased viscosity of blood produced by a high concentration of red cells does not greatly increase the burden on the heart since the effective viscosity in arterioles approaches that of plasma, owing to axial flow. Although anemia may

be an additional reason for giving a dehydrated patient a transfusion, shock is the chief indication. When the red cells by hematocrit are very high, plasma transfusion may be substituted for blood.

Many physicians prefer to use a continuous venoclysis⁹ through which physiologic solution of sodium chloride, dextrose solutions and blood are given at a rate of from 1 to 3 cc. a minute. This procedure may be continued for from one to three or more days. The method has certain advantages of convenience to the physician and also is less painful than large hypodermoclyses. Its effectiveness is brought about not primarily by the fact that the solutions are delivered directly into the vein but by the fact that suitable amounts of salt, water and dextrose are supplied to the body and the fact that blood transfusions are carried out in shock. Certain limitations to the method must be realized. In babies, at least, it is difficult to carry out the procedure without tying a cannula or catheter in a vein, and it is difficult to keep the solutions flowing at a rate of less than 1,500 cc. in twenty-four hours. While injecting at a rate of 1,500 cc. in twenty-four hours may not be harmful to babies when continued for about twelve hours, it is probably too fast for longer periods. At a similar rate an adult would be receiving from 10 to 20 liters of fluid intravenously in twenty-four hours. Karelitz¹⁰ injects about 750 cc. in twenty-four hours by tying a cannula in the vein of infants. He recommends using 5 per cent dextrose in physiologic solution of sodium chloride, since it supplies sodium chloride and does not lead to glycosuria, as does 10 per cent dextrose. Blalock has shown that, while intravenous administration of sodium chloride and dextrose temporarily improve the symptoms in shock, relapses are apt to occur and to be severe, owing to aggravation of the loss of plasma proteins. This fact may explain the frequency of edema following venoclysis. When prolonged intravenous injections of dextrose are suddenly stopped, hypoglycemia develops. In using venoclysis on adults, from 2 to 3 liters in twenty-four hours is apparently a suitable rate, though 5 liters has been given with good results. In babies from 750 to 1,000 cc. is probably a safe amount. When the deficits of salt are greater than is contained in these amounts of physiologic solution of sodium chloride, hypodermoclysis can be used to supplement the venoclysis. In most cases from 5 to 7 per cent dextrose should be added to physiologic solution of sodium chloride for babies, but 10 per cent dextrose added to saline solution may be used in adults. When salt is not necessary, dextrose solutions alone may be used.

No rule can be given as to how much sodium chloride must be given to a dehydrated patient. Recovery from clinical evidences of dehydration and a diuresis containing chloride may be used as guides. However, in adrenocortical insufficiency and in certain cases of hyposthenuric nephritis, excretion of chloride occurs even when body chloride is deficient. From data on animals and patients, I estimate that about one third of the extracellular electrolyte is lost in marked dehydration. For restoration of extracellular electrolyte in such cases, an amount of salt contained in physiologic solution of sodium chloride equal to from one fifteenth to one twelfth of the body weight (about 70 cc. per kilogram of body weight) is required. Smaller amounts

9. Hendon, G. A.: Venoclysis, *J. A. M. A.* **95**: 1175 (Oct. 18) 1930. Hyman, H. T., and Hirschfeld, Samuel: The Therapeutics of the Intravenous Drip, *J. A. M. A.* **100**: 305 (Feb. 4) 1933.

8a. By hemoconcentration reference is made to loss of plasma water, which leads to a rise in the proportion of red cells by hematocrit and to increase in the concentration of serum proteins if these are not simultaneously lost for the circulation.

10. Karelitz, Samuel: The Treatment of Toxicosis with the Aid of a Continuous Intravenous Drip of Dextrose Solution, *Am. J. Dis. Child.* **42**: 781 (Oct., pt. 1) 1931.

are needed in mild cases. When symptoms leading to loss of electrolyte continue, administration of physiologic solution of sodium chloride must be repeated.

In acidosis, hyperpnea usually indicates when sodium bicarbonate or sodium lactate is advisable. However, it is safest to calculate the dose necessary to restore the serum bicarbonate according to the method of Hartmann and Senn.¹¹

$$mM = \frac{(60 - CO_2) 0.7W}{2.24}$$

In the equation, mM is millimols of sodium bicarbonate or sodium lactate. One millimol of sodium bicarbonate is 0.084 Gm. One millimol of sodium lactate is contained in 1 cc. of molar sodium lactate; CO₂ is the serum carbon dioxide content in volumes per cent, and W is body weight in kilograms.

In marked acidosis when serum carbon dioxide is not known, 5 millimols of sodium bicarbonate (0.4 Gm.) per kilogram of body weight is a safe dose. Hartmann recommends the injection of one half the calculated dose of sodium lactate intravenously and one half subcutaneously as one-sixth molar sodium lactate.

Molar sodium lactate is obtainable in sterilized ampules, which most physicians will find more convenient than sodium bicarbonate. Sodium bicarbonate is not obtainable as a sterile solution. Furthermore, it cannot be boiled or autoclaved in an unsealed vessel without forming the highly toxic sodium carbonate. Sodium bicarbonate may be weighed and added with aseptic precautions to sterile water or dextrose solution and injected intravenously in a 2 to 5 per cent solution. Both sodium bicarbonate and sodium lactate may be given by mouth, but in dehydration they are apt to be vomited.

SOLUTIONS USED IN DEHYDRATION

The following remarks on the solutions used in treating dehydration are given to indicate their limitations as well as their usefulness.

Physiologic Solution of Sodium Chloride (0.9 per cent sodium chloride).—Because of the convenience in preparation, physiologic solution of sodium chloride will probably continue to be the most frequently used solution for replacing deficits of extracellular electrolyte. The solution contains relatively more chloride than extracellular fluid, but with normal renal function the relative excess of chloride is excreted so as to free sodium, which may then combine with carbon dioxide to form bicarbonate. In renal disease or when circulatory collapse induces defective renal function, the injection of physiologic solution of sodium chloride may produce or aggravate acidosis. This effect is brought about chiefly by diluting the bicarbonate already in the body at a time when the kidneys are not excreting the excess of chloride. In acidosis this effect may be serious, even when renal function is fairly good, if loss of sodium in excess of chloride continues to occur, as in diarrhea. In most cases physiologic solution of sodium chloride is satisfactory for replacing extracellular electrolyte. It may be injected intravenously or subcutaneously.

Interstitial Salt Solution (sodium chloride 6.5 Gm., sodium bicarbonate 2.5 Gm. and potassium chloride 0.18 Gm. per liter).—Because of the presence of sodium bicarbonate, this solution must be autoclaved in sealed ampules. Fifty cc. ampules containing enough of the salts to make an interstitial salt solution when added

to 500 cc. of sterile water are on the market.¹² This mixture closely resembles interstitial fluid in its electrolyte content. It has none of the disadvantages of physiologic solution of sodium chloride. In fact it may be used in practically all cases of acidosis without additional sodium bicarbonate. The solution may be given subcutaneously or intravenously. The disadvantages are a moderate increase in cost.

Lactate-Ringer's Solution (sodium chloride 6 Gm., sodium lactate 2.7 mg., potassium chloride 0.4 Gm. and calcium chloride 0.2 Gm. per liter).—This solution is prepared in concentrated form in ampules the contents of which are to be diluted twenty-five times with distilled water.¹³ After absorption the lactate is metabolized so that the sodium lactate is converted to sodium bicarbonate. Its uses and advantages are the same as interstitial salt solution.

Dextrose Solutions.¹⁴—Solutions may be prepared by autoclaving dextrose (*d*-glucose) added to distilled water. However, owing to occasional febrile reactions with these preparations most physicians will prefer to add a 50 per cent solution sterilized in ampules to freshly distilled water. Although concentrations up to 50 per cent have been given intravenously, 5 or 10 per cent is the strength usually employed. High concentrations are irritating if they get outside the vein and may produce thrombosis. Dextrose solutions are given for their temporary value in shock, for their antiketogenic effect in ketosis, for their food value when food cannot be taken in adequate amounts by mouth, and finally as a source of water without salt. Dextrose solutions do not supply salt, so they cannot replace extracellular electrolyte, which is the most important loss in dehydration. However, by providing food and aiding the circulation, dextrose solutions help the kidneys to adjust extracellular volume and concentration when sufficient sodium chloride is available. When a patient who has no deficit of extracellular electrolyte must be given all fluids parenterally, intravenous dextrose provides a solution without salt which may be needed to take care of the imperceptible water loss. However, even abnormal kidneys excrete salt solution well if serum proteins are not reduced or cardiac failure is not present. Dextrose may be added to saline solutions for intravenous injection. The body can handle about 1 Gm. of dextrose per kilogram of body weight an hour. With continuous injection the amount of dextrose that can be utilized gradually increases. A small amount of glycosuria is harmless, but large amounts over prolonged periods are to be avoided.

I believe that the general practice of giving so-called isotonic solution of dextrose (5.5 per cent) subcutaneously is seldom justified, since it is irritating locally and over a period of several hours immobilizes water and extracellular electrolyte.¹⁵ In a dehydrated patient this may aggravate an already dangerous depletion of extracellular water and electrolyte. The addition of 5 per cent dextrose to physiologic solution of sodium chloride does not get around this difficulty. A mixture of 2.5 per cent dextrose U. S. P. and 0.45 per cent sodium chloride (i. e. equal parts of physiologic solution of sodium chloride and 5 per cent solution of dextrose)

12. Prepared by Sharp & Dohme Company, Philadelphia.

13. Prepared by Eli Lilly & Co., Indianapolis. This firm also prepares molar sodium lactate.

14. Several well known firms prepare satisfactory ampules of 50 per cent dextrose.

15. Schechter, A. J.; Cary, M.; Katherine; Carpentieri, A. L., and Darrow, D. C.: Changes in Composition of Fluids Injected into the Peritoneal Cavity. *Am. J. Dis. Child.* 46: 1015 (Nov.) 1933.

11. Hartmann, A. F., and Senn, M. J. E.: Studies in the Metabolism of Sodium α -Lactate; II. Response of Human Subject with Acidosis to the Intravenous Injection of Sodium α -Lactate. *J. Clin. Investigation* 11: 357 (March) 1932.

will not withdraw and localize appreciable amounts of extracellular water and electrolyte.

Acacia.—Ampules of 30 per cent acacia suitable for intravenous injection are available. This solution should be diluted to 6 per cent in physiologic solution of sodium chloride and injected slowly into the veins in amounts varying from 5 to 10 cc. per kilogram of body weight. The evidence seems clear that occasional deaths have followed intravenous injections of solutions which probably were properly prepared. Mild reactions are not infrequent. The injected acacia is taken up by the hepatic cells and remains in the cells for months or years. The latter feature seems especially dangerous when repeated doses are given, as has been recommended in nephrosis. The evidence, however, is equally clear that patients in shock can often be saved by acacia, but blood or plasma transfusions will serve the same purpose without similar risks. I believe that the use of acacia should be limited largely to patients in shock who cannot be quickly given transfusions with blood or plasma.¹⁶

SPECIFIC DISEASES

The following remarks on specific diseases or disturbances are given together with a recent reference in order to enable the reader to work out a method of treatment in the light of recent concepts.

Diarrhea.¹⁷—The loss of electrolyte in diarrheal stools resembles the loss of pancreatic juice in its effect on the body; i. e. more sodium than chloride is excreted, and acidosis is the rule. Although physiologic solution of sodium chloride is usually satisfactory for replacing the deficit, interstitial salt solution or lactate-Ringer's solution is more appropriate.

Diabetic Coma.¹⁸—During the development of coma, large amounts of sodium chloride as well as salts of keto-acids are excreted. This aspect of diabetic coma requires the administration of large amounts of sodium chloride and frequently sodium bicarbonate as well. I have used interstitial salt solution and have not felt the need of additional sodium bicarbonate. However, certain cases do require sodium bicarbonate (or sodium lactate), especially if physiologic solution of sodium chloride is the means used to replace extracellular electrolyte.

Nondiabetic Ketosis.¹⁹—Although ketosis occurs at all ages, severe acidosis in patients not suffering from diabetes occurs almost exclusively in young children, especially those under 2 years of age. As a result of vomiting, large deficits of extracellular electrolyte must be replaced by interstitial salt solution, lactate-Ringer's or physiologic solution of sodium chloride. Intravenous administration of solution of dextrose is also indicated to overcome ketosis. Insulin is undesirable.

Nephritis.²⁰—In cases of acute nephritis, vomiting an alkaline gastric juice is the chief cause of the mild

degree of acidosis seen. Although the patients are edematous, the serum concentrations of sodium are usually low. Interstitial salt solution (from 300 to 500 cc.) is often indicated, since it promotes diuresis. Intravenous administration of solution of dextrose is often made to increase the volume of urine, but its use has been disappointing in my experience.

In cases of chronic nephritis vomiting may in part be a cause of dehydration and acidosis. In addition, the kidneys, which form urine of fixed specific gravity, usually excrete sodium and chloride, even when the serum concentrations are low. Furthermore, excretion of an excess of acids leads to loss of sodium. In such cases deficiency of extracellular electrolyte often develops, especially if the patient is given a low salt diet. Often urinary excretion is improved by the addition of a mixture of sodium chloride 6 Gm. to sodium bicarbonate 2 Gm. to the diet in such amounts as to permit replacement of daily urinary loss. However, since chloride and sodium are not well concentrated in the urine by these patients, abnormally high concentrations of serum may occur.

Vomiting.—In cases of pyloric obstruction the vomited gastric juice is apt to be quite acid and its loss lead to alkalosis. While clinical alkalosis with symptoms of tetany is rare, chemical alkalosis with symptoms of dehydration is quite frequent. Although other types of vomiting can give the same result, the vomiting of nephritis, recurrent vomiting of children and that of some infections is probably alkaline, since these diseases are accompanied by acidosis. In alkalosis physiologic solution of sodium chloride is the appropriate treatment, but in acidosis one of the balanced solutions may be more appropriate.

Burns.²¹—The inflammatory exudate of burns is made up of plasma proteins, sodium chloride and water. Since the extracellular electrolyte is fixed at the site of the injury, the rest of the body suffers from deficiency of sodium chloride and sodium bicarbonate. In addition, if a patient with a burn is put in a tub containing water, the denuded surface is no barrier to the diffusion of extracellular electrolyte, and hence continuous tubs can of themselves lead to marked deficiency of extracellular electrolyte. Water in tubs or wet dressings used for treating extensive burns should contain sodium chloride at physiologic strength (9 Gm. per liter) or, better, sodium chloride 6 Gm. and sodium bicarbonate 2.5 Gm. per liter. The loss of plasma proteins makes transfusions essential for extensive burns. Physiologic solution of sodium chloride, interstitial salt solution or lactate-Ringer's solution must be given in maximum amounts in extensive burns.

Traumatic Shock.—Blalock⁷ and others have demonstrated that plasma protein, water and electrolyte escape the capillary walls at the site of traumatic injury. These losses, as those in burns, must be treated with transfusions and saline solution.

Addison's Disease.²²—Adrenocortical insufficiency is accompanied by the excretion of sodium and chloride in

16. Andersen, M., and Gibson, R. B.: Deposition of Acacia in the Liver and Other Organs and Its Excretion in Urine and Bile, *J. Pharmacol. & Exper. Therap.* 52: 390 (Dec.) 1934. Maytum, C. K., and Magath, T. B.: Sensitivity to Acacia, *Proc. Staff Meet., Mayo Clin.* 7: 216 (April 13) 1932. Good, R. W.; Murgage, R., and Weiskittel, R.: Acacia Solution in Treatment of Shock, *Am. J. Surg.* 25: 134 (July) 1934.

17. Fowers, G. F.: A Comprehensive Plan of Treatment for So-Called Intestinal Intoxication of Infants, *Am. J. Dis. Child.* 32: 232 (Aug.) 1926. Darrow, D. C.: Summer Complaint; Cholera Infantum, in *The Practitioners Library of Medicine and Surgery*, New York, D. Appleton-Century Company, vol. 7, p. 349. Karelitz.¹⁹

18. Kydd, D. M.: Salt and Water in the Treatment of Diabetic Acidosis, *J. Clin. Investigation* 12: 1169 (Nov.) 1933. Atchley, D. W.; Loeb, R. F.; Richards, D. W., Jr.; Benedict, E. M., and Driscoll, M. E.: On Diabetic Acidosis: A Detailed Study of Electrolyte Balances Following the Withdrawal and Reestablishment of Insulin Therapy, *J. Clin. Investigation* 12: 297 (March) 1933.

19. Darrow, D. C., and Cary, M. Katherine: A Clinical and Chemical Study of Nondiabetic Ketosis with Acidosis, *J. Pediat.* 6: 676 (May) 1935.

20. Peters, J. P.: Salt and Water Metabolism in Nephritis, *Medicine* 11: 435 (Dec.) 1932.

21. Blalock, Alfred: Experimental Shock: VII. The Importance of Local Loss of Fluid in the Production of Low Pressure After Burns, *Arch. Surg.* 22: 610 (April) 1931.

22. Harrison, H. E., and Darrow, D. C.: Renal Function in Experimental Adrenal Insufficiency, *Am. J. Physiol.* 125: 631 (April) 1939. Wilder, R. M.; Kendall, E. C.; Snell, A. M.; Kepler, E. J.; Ryncarson, E. H., and Adams, Mildred: Intake of Potassium, an Important Consideration in Addison's Disease: A Metabolic Study, *Arch. Int. Med.* 59: 367 (March) 1937. Ferrebee, J. W.; Ragan, Charles; Atchley, D. W., and Loeb, R. F.: Desoxycorticosterone Esters: Certain Effects in the Treatment of Addison's Disease, *J. A. M. A.* 114: 1725 (Nov. 4) 1939. Thorn, C. W.; Howard, R. P., and Emerson, Kendall: Treatment of Addison's Disease with Desoxycorticosterone Acetate, a Synthetic Adrenal Cortical Hormone, *J. Clin. Investigation* 18: 449 (Feb.) 1939. Harrison and Darrow.²

the urine even when serum concentrations are abnormally low. However, in addition, potassium is not excreted except at a low urinary concentration even though serum concentration is high. As deficit of body sodium and chloride develops, the defect of renal function which is characteristic of deficit of extracellular electrolyte becomes superimposed on the disturbance in renal function due specifically to lack of cortical hormone. Without cortical hormone, sodium chloride must be given to patients with Addison's disease not only to replace the continually recurring deficits of sodium chloride but also to enable the volume of urine to be increased so that sufficient potassium can be excreted even at low urinary concentrations. Except during crises, sufficient sodium chloride can be given by mouth. When large amounts (more than 20 Gm.) are necessary, it is better to give sodium bicarbonate (or equivalent amounts of sodium lactate or citrate) along with sodium chloride in the proportions found in serum (i. e. sodium chloride 6 Gm. to sodium bicarbonate 2.2 Gm.). Lowering the intake of potassium lessens the requirement of sodium salts. While sodium salts do not restore all the functions that are carried out by cortical hormone, many patients can be kept alive with salt alone. Until recently salt seemed to be necessary for treatment even in conjunction with cortical extracts. The synthetic product desoxycorticosterone seems particularly effective in restoring renal function and, after any initial deficit has been replaced, large amounts of salt are contraindicated during treatment with this compound.

*Heat Prostration and Heat Cramps.*²³—Sweating caused by hot weather or work in hot places can produce large deficits of sodium chloride. Usually water is drunk by patients having heat cramps, so that the deficit of sodium and chloride is greater than that of water. Sodium chloride relieves the patient, and salty meals or 0.1 per cent solution of sodium chloride used as drinking water will prevent the disturbance. In certain cases the mechanism regulating body temperature ceases to function and temperatures of from 40 to 45 C. (104 to 113 F.) may develop. Although deficits of salt should be treated in these cases, reduction of the body temperature by ice tubs is imperative, since permanent brain damage can be produced by the fever alone.

SUMMARY

The treatment of dehydration is the replacement of the deficit of extracellular electrolyte and water and maintenance of blood circulation and volume. Administration of solutions containing sodium chloride will correct the disturbance in the electrolyte pattern in alkalosis and in moderate acidosis. A balanced salt solution is advantageous in all types of severe dehydration, when renal function is defective or when continued loss of extracellular electrolyte may be expected. Sodium bicarbonate or sodium lactate can be given for severe acidosis. The maintenance of blood volume and circulation is essentially the treatment of shock, namely blood or plasma transfusion, intravenous infusion of dextrose and, at times, salt solutions.

789 Howard Avenue.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.
PAUL NICHOLAS LEECH, Secretary.

OVARIAN CONCENTRATE GLANULES, ANTI-MENORRHAGIC FACTOR GLANULES AND OVARIAN-ANTERIOR PITUITARY LIQUID NOT ACCEPTABLE FOR N. N. R.

Several products of the Armour Laboratories—Ovarian Concentrate Glanules, Anti-Menorrhagic Factor Glanules and Ovarian-Anterior Pituitary Liquid—have been advertised recently to physicians.

Ovarian Concentrate is marketed by Armour Laboratories for the treatment of acne, headaches, hypertrichosis and other disturbances incident to the sex cycle. According to the firm's circular, this preparation contains a "sterole fraction free from demonstrable estrogenic properties derived from the fat and lipid fractions of whole ovaries by a special process originated in the Armour Laboratories." The firm fails to explain what physiologic activity is possessed by this fraction of the ovary as determined by appropriate experimental investigation. No bio-assays of any sort are included in their description of product. The firm states: "The main beneficial influence of Special Ovarian Concentrate Armour is on the skin, not merely at puberty, but throughout the entire gonadal active period." Other claims for therapeutic application of this material are: "Special Ovarian Concentrate therapy has been reported to be beneficial occasionally in relieving the unpleasant symptoms, particularly headache, associated with dysmenorrhea and periodic acne . . ." and "Some clinicians have obtained promising results with Special Ovarian Concentrate Glanules in hirsutism associated with the adreno-genital syndrome." It is also mentioned that this material will lower blood pressure, which in certain patients, according to the firm, is desirable. The clinical data presented is quite meager, consisting of several testimonials as to its therapeutic value in acne and headaches. This evidence is obviously not based on sound experimentation, nor is it in accord with accepted scientific principles. The actual mechanism by which the claimed therapeutic responses are obtained is a deep mystery to even those who are well acquainted with the physiologic functions of the ovary.

Other than for progestin, animal ovaries have been found to be an unsatisfactory commercial source for ovarian hormone. If there is any evidence that factors can be extracted from ovaries other than progestin, the Armour Laboratories is obligated to publish this information. Conclusions must depend on the available literature, which at the present time does not supply adequate data to support the advertising claims.

A new concept of menorrhagia heretofore undescribed in the scientific literature has been developed recently by the Armour Laboratories. In spite of the lack of confirmatory evidence, the firm proposes that a certain sterol fraction of mammalian liver is effective in checking functional uterine hemorrhage. This extract is prepared in the form of "Anti-Menorrhagic Factor Glanules." It is reported by Wiles and Maurer (The Anti-Menorrhagic Factor of Mammalian Liver Fat, *Science* 89:293 [March 31] 1939) that this lipid preparation of liver, which is stated not to be vitamin K, was effective in diminishing the excessive bleeding in cases of functional menorrhagia. Curtis has also written in his textbook (Textbook of Gynecology, Philadelphia, W. B. Saunders Company, 1938, pp. 111 and 404) that Anti-Menorrhagic Factor-Armour was found satisfactory in the treatment of uterine hemorrhage. No other evidence—physiologic or clinical—is available, however, which supports or confirms these claims. In view of the absence of appropriate protocols and sufficient clinical and laboratory data, it appears that the firm has been either premature or over-enthusiastic in promoting this preparation. Certainly, such evidence as is presented in the advertising would not be generally accepted as a sound basis for therapy.

23. Ferris, E. B., Jr.; Blankenhorn, M. A.; Robinson, H. W., and Cullen, G. E.: Heat Stroke: Clinical and Chemical Observations in Forty-Four Cases, *J. Clin. Investigation* 17:249 (May) 1938. Talbot, W.: Heat Cramps, *Medicine* 14:323 (Sept.) 1935. Yarnett and

A third preparation, Ovarian-Anterior Pituitary Liquid, resembles the others in the absence of scientific evidence, either physiologic or clinical, on which to base any claims for therapeutic effectiveness. It is in the nature of a shotgun mixture, supposedly supplying to patients certain ovarian hormones and at the same time stimulating with pituitary gonadotropic hormone the patient's own ovaries. From the firm's claim that each ampule of Ovarian-Anterior Pituitary Liquid is equivalent to 12 grains of fresh anterior pituitary lobe and 30 grains of fresh whole ovarian tissue, it appears certain that the activity in such an ampule cannot possibly amount to more than a few rat units of each hormone, which for therapeutic purposes is insignificant. Apparently the firm has become aware of its doubtful therapeutic value, since in answer to a request from the Council office for information regarding these products it stated that it has discontinued distributing advertising material for Ovarian-Anterior Pituitary Liquid.

It is generally accepted that the recent advances in the field of reproductive physiology have been truly remarkable. In the past decade or so the abundant experimental work has resulted in a rapid development of our knowledge of sex hormones and their use in therapy. Years ago our lack of knowledge of endocrine physiology in general served as an excuse for the administration of certain ovarian preparations whose action and potency were unknown. Today, however, there are excellent preparations available to the physician at reasonable cost which are pure, very potent and whose effects are quite well known. The Armour Laboratories shows an unwarranted amount of optimism in urging physicians to choose preparations of little or no scientific or rational basis rather than the pure, potent preparations whose physiologic and therapeutic actions have been competently investigated in the laboratory and clinic. In view of the present day status of sex hormones there seems to be no justification for the existence of the three products described unless more scientific evidence of their therapeutic worth is reported.

The Council declared Ovarian Concentrate Granules, Anti-Menorrhagic Factor Granules and Ovarian-Anterior Pituitary Liquid (The Armour Laboratories) unacceptable for inclusion in New and Nonofficial Remedies because of the lack of scientific evidence to justify their use and because of unwarranted therapeutic claims.

CHAPPEL LIVER EXTRACT ORAL, CHAPPEL LIVER EXTRACT SUBCUTANEOUS AND CHAPPEL LIVER EXTRACT CONCENTRATED INTRAMUSCULAR OMITTED FROM N. N. R.

Three dosage forms of Chappel Liver Extract manufactured by Chappel Laboratories, Rockford, Ill., have stood accepted in N. N. R. for a number of years. Representatives of the firm recently made inquiry whether or not the products would maintain an accepted status if they were distributed by a firm which has no product accepted in N. N. R. and which is not considered acceptable by the Council. The representatives were informed that the Council could not countenance the distribution of products by firms which have not been recognized by the Council and, therefore, transfer of these products from the Chappel Laboratories to another firm would be an infraction of the rules.

Under date of October 24 the Council was informed of an announcement to the drug trade that the preparations of Chappel Laboratories would be distributed by a firm not recognized by the Council, although the Chappel Laboratories will continue to manufacture and control the composition of the product. The Council feels in this instance that Chappel Laboratories has withdrawn from its agreement to abide by the rules of the Council; the appointment of a second firm as distributor means that Chappel Laboratories is no longer the responsible distributor for the products. The Council, therefore, under its rules, rescinds acceptance of the products Chappel Liver Extract Oral, Chappel Liver Extract Subcutaneous and Chappel Liver Extract Concentrated Intramuscular and announces their omission from New and Nonofficial Remedies.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

FATS AND OILS (See Accepted Foods, 1939, p. 30).

Pompeian Olive Oil Corporation, Baltimore.

POMPEIAN BRAND OLIVE OIL.

Analysis (submitted by manufacturer).—Specific gravity at 25 C. 0.911, saponification number 195, iodine number 86.32, solidification point of fatty acids 17.5 C., acid number 1.35, acidity as oleic acid 0.69%, cottonseed oil none, sesame oil none, peanut oil none, teaseed oil (Fitelson test) none.

Calories.—9 per gram; 256 per ounce.

Supreme Olive Oil Corporation, San Fernando, Calif.

BENEDETTO BRAND SPECIAL OLIVE OIL, an olive oil further refined by treatment with steam to remove the more volatile substances.

Analysis (submitted by manufacturer).—Moisture 0.04%, total solids 99.96%, ash none, fat (ether extract) 100.00%, crude fiber none, carbohydrates none, specific gravity at 25 C. 0.913%, free fatty acids (as oleic) 0.20%, unsaponifiable matter 0.41%, saponification value (Koettstorfer) 192.5%, iodine value (Wijs) 85.9%, smoke point 185 C., melting point (fatty acids) 26.2 C., cottonseed oil (Halphen test) negative, sesame oil (Baudouin test) negative, teaseed oil (Fitelson test) negative, refractive index at 40 C. 1.4621.

Calories.—9 per gram; 255.6 per ounce.

FOODS FOR SPECIAL DIETETIC PURPOSES (See Accepted Foods, p. 295).

The Chicago Dietetic Supply House, Inc., Chicago.

CELLU BRAND JUICE-PAK ELBERTA FREESTONE PEACHES (HALVES).

Analysis (submitted by manufacturer).—Moisture 86.4%, total solids 13.6%, ash 0.4%, fat (ether extract) 0.5%, protein (N \times 6.25) 0.5%, crude fiber 0.4%, reducing sugar as invert sugar 4.0%, sucrose 5.2%, carbohydrates other than crude fiber (by difference) 11.8%, undetermined carbohydrates other than crude fiber (by difference) 2.6%.

Calories.—0.54 per gram; 15 per ounce.

PREPARATIONS USED IN THE FEEDING OF INFANTS (See Accepted Foods, 1939, p. 156).

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT BRAND STRAINED LIVER AND BEEF SOUP WITH VEGETABLES, BARLEY AND RICE.

Analysis (submitted by manufacturer).—Moisture 84.3%, total solids 15.7%, ash 0.6%, fat (ether extract) 1.3%, protein (N \times 6.25) 4.1%, crude fiber 0.3%, total carbohydrates other than crude fiber (by difference) 9.4%, copper 0.000240%, iron 0.00125%, specific gravity 1.061%.

Calories.—0.66 per gram; 18.7 per ounce.

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S BRAND STRAINED PEARS AND PEACHES.

Analysis (submitted by manufacturer).—Moisture 78.9%, total solids 21.1%, ash 0.2%, fat (ether extract) 0.1%, protein (N \times 6.25) 0.3%, crude fiber 0.8%, carbohydrates other than crude fiber (by difference) 19.7%, calcium (Ca) 0.0074%, phosphorus (P) 0.0011%, iron (Fe) 0.0009%, copper (Cu) 0.0003%.

Calories.—0.81 per gram; 23 per ounce.

Gerber Products Company, Fremont, Mich.

GERBER'S BRAND DRY PRE-COOKED CEREAL FOOD, a flaked dried cooked mixture of wheat, semolina, yellow cornmeal, wheat germ, malt, dried brewers' yeast, dicalcium phosphate ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$), sodium chloride, and iron and ammonium citrates (U. S. P.).

Analysis (submitted by manufacturer).—Moisture 5.6%, total solids 94.4%, ash 4.5%, fat (ether extract) 1.3%, protein (N \times 6.25) 12.4%, crude fiber 1.3%, carbohydrates other than crude fiber (by difference) 74.9%, calcium (Ca) 0.675%, phosphorus (P) 0.7989%, iron (Fe) 0.0300%.

Calories.—3.60 per gram; 102 per ounce.

Vitamins.—Report of biologic assay (1939) submitted by the manufacturer indicates that the product contains approximately 2.8 international units of vitamin B₁ per gram, 80 per ounce, and 1.4 Sherman-Bourquin units of vitamin G (riboflavin) per gram, 40 per ounce.

Libby, McNeill & Libby, Chicago.

LIBBY'S BRAND HOMOGENIZED SPINACH.

Analysis (submitted by manufacturer).—Moisture 94.1%, total solids 5.9%, ash 1.4%, sodium chloride 0.9%, fat (ether extract) 0.3%, protein (N \times 6.25) 1.6%, crude fiber 0.8%, carbohydrate other than crude fiber (by difference) 1.8%, calcium (Ca) 23.0 mg. per 100 Gm., phosphorus (P) 7.1 mg. per 100 Gm., iron (Fe) 3.0 mg. per 100 Gm., copper (Cu) 0.227 mg. per 100 Gm.

Calories.—0.16 per gram; 4.5 per ounce.

Vitamins.—Protocols of biologic assay (1939) show that the product contains 16.3 U. S. P. units of vitamin A per gram, 463 per ounce, vitamin B₁ is practically absent; 0.13 Sherman-Bourquin units vitamin G (riboflavin) per gram, 3.8 per ounce; and, according to a report of chemical titration (1939), 0.35 international unit vitamin C per gram, 10.2 per ounce.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 24, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

COMPARATIVE VALUE OF SERUM THERAPY AND CHEMOTHERAPY IN PNEUMO- COCCIC PNEUMONIA

Serotherapy of pneumococcic pneumonia is specific and is based on the fact that infection with pneumococci provokes in the invaded organism the production of antibodies. These antibodies unite with the antigenic or the capsular carbohydrate, thus rendering the pneumococci sensitized so that they are lysed, phagocytosed and destroyed. The mortality rate of pneumococcic pneumonia, when treated by the type specific serum, has been reported from various sources to be between 2 and 10 per cent. The significant advance presented by this therapy is not without certain minor disadvantages, which must be kept in mind. They are listed by Bullowa¹ as follows: (1) Serum administered must be specific for the infecting type; (2) some types, such as pneumococcus type III, are resistant

to serum; (3) serum must be given intravenously; (4) there is a possibility of anaphylaxis, thermal reactions and serum sickness; (5) serum therapy is expensive. The development of the rabbit serum represents progress since it makes possible, as pointed out by Finland,² treatment of patients who are specifically sensitive to horse serum, particularly those who have previously received injections of horse serum. This applies particularly to type XIV pneumococcus pneumonia, in which horse serum has been known to give rise to severe and even fatal reactions because of its property of agglutinating human erythrocytes of all blood groups. The antipneumococcus type XIV rabbit serum does not possess this property.

In 1938 Whitby reported striking results obtained in experimental pneumococcic infections of mice with sulfapyridine, a sulfonamide derivative. His observations were soon confirmed by Long and his co-workers,³ who demonstrated in animal experiments that the drug is about as efficient as is sulfanilamide in the treatment of experimental streptococcic, meningococcic and Clostridium welchii infections in mice and somewhat superior to sulfanilamide in the treatment of experimental pneumococcic, Friedländer's bacillus and staphylococcic infections in mice. Both investigators state that the new drug, unlike sulfanilamide, is irregularly absorbed and slowly excreted. The presence of the additional pyridine molecule does not make the drug more toxic than the sulfanilamide. In the animal body sulfapyridine exerts a bacteriostatic effect on the pneumococcus. Growth of the organisms is retarded, while the rate of antibody production is undiminished.

Evans and Gaisford⁴ reported 100 cases of lobar pneumonia treated with sulfapyridine. The mortality rate in their experience was 8 per cent as compared with 27 per cent in a controlled series observed at the same time. Flippin and his associates⁵ reported four deaths in a series of 100 cases and state that the drug brought about within twenty-four to forty-eight hours a critical drop in temperature followed by prompt clinical improvement. Similar favorable results are reported by Barnett and his co-workers.⁶ MacLeod⁷ calls attention to certain toxic effects of the drug, such as frequent nausea and vomiting, morbilliform rashes and cyanosis, and Finland² mentions severe mental and physical depression and marked excitement, impaired renal function and one instance of granulocytopenia. Finland also states that a number of cases have been reported in the literature in which,

2. Finland, Maxwell; Spring, W. C.; Lowell, F. C., and Brown, J. W.: Specific Serotherapy and Chemotherapy of the Pneumococcic Pneumonia. *Ann. Int. Med.* 12: 1816 (May) 1939.

3. Sulfapyridine, editorial, J. A. M. A. 112: 540 (Feb. 11) 1939.

4. Evans, G. M., and Gaisford, W. F.: Treatment of Pneumonia with 2-(p-Aminobenzenesulfonamido) Pyridine. *Lancet* 2: 14 (July 2) 1938.

5. Flippin, H. F.; Lockwood, J. S.; Pepper, D. S., and Schwartz, Leon.: The Treatment of Pneumococcic Pneumonia with Sulfapyridine. *J. A. M. A.* 112: 529 (Feb. 11) 1939.

6. Barnett, H. L.; Hartmann, A. F.; Perley, Anne M., and Bates, Mary B.: The Treatment of Pneumococcic Infections in Infants and Children with Sulfapyridine. *J. A. M. A.* 112: 518 (Feb. 11) 1939.

7. MacLeod, C. M.: Chemotherapy of Pneumococcic Pneumonia. *J. A. M. A.* 113: 1495 (Oct. 7) 1939. Sulfapyridine: Report of the Council on Pharmacy and Chemistry, *Id.* 11: 4: 327 (Jan. 27) 1940.

1. Bullowa, Jesse G. M.: Serotherapy of the Pneumonias, *J. A. M. A.* 113: 1402 (Oct. 7) 1939.

after treatment with sulfapyridine alone, relapse of the pneumonia occurred in the same or other portions of the lung. Such relapses have occurred from three to ten or more days after complete subsidence of fever and after what was considered to be an adequate dose of the drug.

In view of the almost equally enthusiastic reports regarding these new therapeutic agents, the practitioner is confronted with the problem of choosing the one or the other or the combination of the two. Studies relative to their comparative effectiveness have thus far been few. Finland and his co-workers report a mortality rate of 13 per cent in 167 cases treated with the specific serum alone. The death rate in ninety-five cases treated with sulfapyridine alone was 15 per cent. A group of eighty patients was chosen for combined treatment with sulfapyridine and serum. This group contained a greater proportion of older patients and the incidence of bacteremia was about twice that in the cases treated with serum alone and three times that in the cases treated with sulfapyridine alone. The mortality in this group was only 22 per cent. In similar cases treated without specific serums or drugs the expected fatality rate is between 75 and 90 per cent; with specific serums alone it is from 50 to 60 per cent.

When serum alone is administered, a defervescence occurs after six to twenty-four hours in the great majority of cases, whereas sulfapyridine must be continued for at least forty-eight to seventy-two hours or even longer after the defervescence. Finland feels that sulfapyridine may be started in all cases as soon as the diagnosis of pneumonia is established, with the exception of cases in which there is polymorphonuclear neutropenia. He further feels that the drug, at least for the time being, should not be given to patients with jaundice or known or suspected liver or kidney disease. He would give specific serums as soon as possible to patients over 40 years of age and to all pregnant or recently parturient women in whom any of the common types of pneumococci are found, and in all cases in which the blood cultures yield specific types of pneumococci. He concludes that both specific serums and sulfapyridine are effective agents and that in cases of severe involvement the use of the combination of the drug and specific serum has shown definite effects in reducing the fatality in the severest group, in which the mortality is the highest. Dowling and Abernethy⁸ present a careful clinical study undertaken to evaluate the relative value of the two agents. In a group of ninety cases serum alone was administered and in a group of 130 sulfapyridine alone. The two groups were about similar in severity and were treated at the same time. The total mortality rate for the serum treated group was 16.7 per cent, while that for the sulfapyridine treated group was 11 per

cent. The mortality rate among the patients to whom the serum was administered during the first four days was 10.8 per cent. The mortality rate among thirty-four patients receiving sulfapyridine during the first four days was less than 3 per cent. Sulfapyridine seemed to be more effective for older patients and for patients with involvement of two or more lobes, while the two agents seemed to be of equal value in bacteremic cases. Empyema developed in six of the ninety-six serum treated cases (6.1 per cent) and in four of the 136 sulfapyridine treated cases (2.9 per cent).

The clinical evidence furnished thus far establishes the efficacy of both serotherapy and the new chemotherapy in lowering the death rate from pneumococcic pneumonia. The relative value of the two methods and the indications for their employment, as well as for the combined use of the two, await further clinical studies.

HORMONE REFRACTORINESS

Persistent endocrine therapy often leads to the development of hormone refractoriness. A continuation of the therapy after this condition develops is of little value and may cause deleterious results. Collip¹ and his co-workers showed that hormone refractoriness may develop in experimental animals even though endocrine products from the same animal species are selected and that acquired hormone refractoriness is serologically transferable. Determination of the origin, nature and method of action of the serum component responsible for this transfer is of basic clinical interest.

The refractoriness serum components have been considered to be inhibiting hormones or hormone-destroying enzymes presumably formed as a result of a compensatory hypertrophy of antagonistic endocrine glands. This theory finds some histologic support² and is apparently confirmed by the indirect serologic evidence recently reported by Sulman,³ of the Rothschild Hospital, Jerusalem.

Sulman tested the antigenic properties of a wide range of gonadotropic substances in laboratory animals. He found that rabbits injected with crude gonadotropic substance develop relatively high-titer complement-deviating antibodies in their blood serum. When purified gonadotropic substance is injected, however, either alone or in combination with a protein carrier (swine serum), complement-deviating antibodies are not demonstrable. He concluded from this negative evidence that hormones per se are nonantigenic and do not acquire antigenicity when combined with alien proteins. In his opinion the apparent antigenic properties of crude gonadotropic substance must be attributed to accompanying impurities. Antihormones, therefore, "must be looked upon as protective ferments, but certainly not as antibodies."

8. Dowling, H. F., and Abernethy, T. J.: The Treatment of Pneumococcus Pneumonia: A Comparison of the Results Obtained with Specific Serum and with Sulfapyridine. *Am. J. M. Sc.* 199: 55 (Jan.) 1940.

1. Collip, J. B.: *J. Mount Sinai Hosp.* 1: 28 (May-June) 1934.
2. Collip, J. B.; Selye, Hans, and Williamson, J. E.: *Endocrinology* 23: 279 (Sept.) 1938. Sevringhaus, Aura E., and Thompson, K. W.: *Proc. Soc. Exper. Biol. & Med.* 40: 627 (April) 1939.
3. Sulman, Felix: *J. Exper. Med.* 65: 1 (Jan.) 1937.

A quite different conclusion is currently drawn from indirect physiologic evidence by Gordon, Kleinberg and Charipper,⁴ of the Department of Biology, New York University. It is generally believed by immunologic theorists⁵ that the reticulo-endothelial system is the essential tissue responsible for the synthesis or internal secretion of specific antibodies. The New York investigators therefore tested the effects of reticulo-endothelial extirpation and blockade on the rate of development of hormone refractoriness. They found that a daily subcutaneous injection of pregnant mare serum gonadotropin, for example, caused a rapid initial increase in ovarian weight in normal female rats, maximum weight being reached on the seventeenth day. Endocrine refractoriness became apparent after that date. In spite of continued daily injections of the hormone the ovarian weight rapidly decreased and was reduced to that of untreated controls by the end of two months. In parallel tests with splenectomized female rats the initial rate of ovarian increase was twice as fast and the development of refractoriness delayed till after the twenty-fifth day.

Even more striking differences were obtained by combining splenectomy with reticulo-endothelial blockade, the latter being effected by intraperitoneal injections of trypan blue. Hormone refractoriness, with resulting regression in ovarian weight, was not observed after such complete reticulo-endothelial exclusion even though the daily hormone injections were continued for fifty-five days. Titration of antihormones by serum transfer showed a quantitative parallelism between delayed refractoriness and antihormonal serum titer.

Their conclusion that integrity of the reticulo-endothelial system is essential for the development of hormone refractoriness was confirmed by a study of other hormones. The effects of splenectomy on the development of testicular hypertrophy in male rats following daily injections of gonadotropic substance was in accordance with the same law. The effects of splenectomy plus dye blockade on the metabolic rates of guinea pigs following daily injections of thyrotropic hormone were also confirmatory. Hormone refractoriness developed by the twentieth day in guinea pigs with intact reticulo-endothelial systems but was delayed for at least fifty days in splenectomized dye blockade controls.

Gordon and his colleagues argue that, since participation of the reticulo-endothelial system is essential for the development of hormone refractoriness, it is a logical presumption that antihormones are the result of immunologic adaptations. Antihormones therefore must be considered as true antibodies in spite of their alleged failure to give routine complement deviating test tube reactions. A modification of the routine in vitro technic might conceivably give positive results.

Current Comment

THE NATIONAL CONFERENCE ON MEDICAL NOMENCLATURE

Elsewhere in this issue (page 669) appears the program of the National Conference on Medical Nomenclature, which will be held in Chicago on March 1. The purpose of this conference is to discuss certain problems of medical terminology and classification and probably arrange for their continued consideration by the formation of permanent nomenclature committees. The national societies in specialized fields of medicine have been invited to send delegates to the conference.

PERIPHERAL VASCULAR DISEASE

The February issue of the *Archives of Surgery* is devoted to a symposium on peripheral vascular disease containing contributions from leading authorities in this field. Among the subjects discussed are the treatment of occlusive arterial disease, amputation, differential diagnosis and peripheral vascular spasm from tobacco. Special articles are devoted to surgical intervention on the sympathetic nervous system, heparin in surgical treatment of the blood vessels, the effect of estrogens on vascular spasm and a review of nearly 1,000 cases of diabetic gangrene and other aspects of the problem. The symposium is a mine of information on the latest advances in the knowledge and treatment of peripheral vascular disorders.

EFFECT OF PECTIN ON BACTERIAL GROWTH

Since recognition of the therapeutic value of raw apple in certain diarrheas, a number of investigations have been made on the alleged germicidal action of pectin on intestinal organisms. Recently Prickett and Miller¹ have observed the effect of pectin and nickel pectin on bacterial growth. Their procedure involved the addition of various samples of pectin to nutrient broth and the subsequent incubation in these mediums of typical cultures of *Escherichia coli* isolated from feces. Plate counts were made at various intervals. Control of the pH was carefully observed. Thirteen different commercial pectins were studied. From the results obtained it was concluded that there is no reason to believe that pectin per se is bactericidal and that whatever unfavorable effect on bacterial growth is noted in pectin broth is the result of acidity. A further investigation was made in which nickel chloride in known amounts was added to three different nickel free samples of pectin. The results from the use of these preparations indicated that the bactericidal effect of nickel varies directly with its concentration. The pH of the medium, the buffer effect of pectin and the presence or absence of fermentable material modify but do not essentially change this effect. Clearly, however, the results of these in vitro observations cannot yet be interpreted as explaining the mechanism of action of pectins on the flora of the human gastrointestinal tract.

4. Gordon, A. S.; Kleinberg, William, and Charipper, H. A.: *J. Exper. Med.* 70: 333 (Oct.) 1939.

5. Perla, David, and Marmorston, Jessie: *The Spleen and Resistance*, Baltimore, Williams & Wilkins Company, 1935, chapters 3 and 4.

1. Prickett, P. S., and Miller, N. J.: *In Vitro Effect of Pectin and Nickel Pectin on Bacterial Growth*, *J. Pediatr.* 15: 710 (Nov.) 1937.

ORGANIZATION SECTION

NATIONAL PHYSICIANS' COMMITTEE

BOARD OF DIRECTORS MEETS FOR CONSIDERATION OF NEW PROPOSED LEGISLATION

The following report pertaining to the activities of the National Physicians' Committee has been submitted and is published for the information of the readers of THE JOURNAL:

On February 12, at a regular meeting of the Board of Trustees of the National Physicians' Committee for the Extension of Medical Service, action was taken to increase the number of voting trustees from twelve to fifteen members. Because of continuing ill health, Dr. John A. Hartwell tendered his resignation. The resignation was accepted and Dr. Charles Gordon Heyd, of New York, was unanimously elected to fill the vacancy. Drs. Harvey B. Stone, Baltimore, James A. Paullin, Atlanta, Ga., Edward J. McCormick, Toledo, Ohio, and Charles Dukes, Oakland, Calif., were elected to membership on the Board of Trustees.

The organization setup of the National Physicians' Committee for the Extension of Medical Service consists of a Central Committee, now numbering more than 425 physicians, on which every state has representation and which is being constantly increased; a Board of Trustees, of which Dr. Edward H. Cary, Dallas, Texas, is chairman, Dr. Austin A. Hayden, Chicago, secretary, and Dr. N. S. Davis III, treasurer, and a Management Committee of five of the trustees. Drs. Cary, Hayden and Davis are members of the Management Committee. At the Chicago meeting Dr. W. F. Braasch, of Rochester, Minn., and Dr. Edward H. Skinner, of Kansas City, were elected to membership.

Chairman Cary reported in detail on the prospect of federal legislation during the present session of Congress. According to this report there was the likelihood of the President's hospital bill being enacted into law. He considered this of lesser importance than the prospect of a continuation of adverse propaganda that was confusing the people and tending to destroy the confidence of the public in the effectiveness of American

medicine and in the practicing physician. He pointed out that the National Physicians' Committee had assumed a tremendously important responsibility and undertaken an exceedingly difficult task. He indicated that the initial response from the profession had been gratifying beyond all expectations.

Dr. Hayden, as secretary, presented a report that was unanimously approved. This report indicated that the response had been actually nationwide, with physicians from every state sending contributions and participating by way of Central Committee membership. In order of the amount of contributions, Illinois was first and Pennsylvania second, closely followed by New York, Minnesota, California, Texas and Ohio, with Connecticut and Washington making the best relative showings on a basis of population. It was reported that many county medical societies and clinics had contributed to the support of the Committee.

Dr. N. S. Davis III, as treasurer, submitted a financial statement which indicated that, with a continuation of the support of physicians, a sound financial structure would result that would insure effective action.

Executive Administrator John M. Pratt reported that the board of directors of the National Retail Druggists Association had voted approval and for active cooperation and that the Drug and Pharmaceutical Manufacturers groups and the owners of medical buildings throughout the United States were most sympathetic. In addition, hospital executives and members of the dental profession are interested.

In adjourning, Chairman Cary stated that there was no doubt as to the need for the organization, the importance of the task that had been undertaken, or the outstanding success of its preliminary efforts. However, said Dr. Cary, "the ultimate effectiveness of the Committee will be determined by the extent to which it receives support from the rank and file of all practicing physicians."

THE CLINICAL PATHOLOGIST

MEMORANDUM SENT TO THE BOARD OF TRUSTEES OF THE AMERICAN MEDICAL ASSOCIATION

It is not usually considered that clinical pathology is one of the youngest branches of medicine. The first pathologist who devoted full time to the subject, Dr. Frederic Sondern, of New York, is still alive and is an honored member of the American Medical Association, having served on many of its important committees. Previous to twenty-five years ago, one could scarcely speak of clinical pathology as a specialty since so few men had given particular thought or study to the subject and since there was no organization of the subject in the form of private practice.

Those men who had a particular leaning toward the application of pathology to clinical medicine were in a large part members of the American Association of Pathologists and Bacteriologists, which society was developed along rather broad scientific concepts and which has constantly disclaimed any particular interest in the economic problems relating to the practice of pathology.

It was under these conditions that the American Society of Clinical Pathologists was organized in 1921. The charter members desired the society to serve as an organization for those men who were primarily interested in clinical pathology and its application to the actual practice of medicine. They fully recognized the importance and desirability of having men join

the society whose interests were also in research. In addition to these aims, it was the intention of the group to place clinical pathology on a basis equal to that of any other specialty in medicine, both professionally and economically.

The American Society of Clinical Pathologists early took consideration of the problem of laboratory technicians. It has established the Registry of Medical Technologists, in which nearly 9,000 technicians are now registered, and has established the standards of proficiency and standard curriculums for approved training schools. This is now a cooperative enterprise of the American Society of Clinical Pathologists and the Council on Medical Education and Hospitals of the American Medical Association. The Society took the initiative in establishing the American Board of Pathology. The Society has sponsored annual seminars in tumor diagnosis and frequent hematologic seminars, and it has also sponsored and financed the Tumor Registry at the Army Medical Museum. This unique wealth of material is now available to any physician for study. It inaugurated the Committee on the Evaluation of Serodiagnostic Tests for Syphilis in cooperation with the United States Public Health Service. The Society now has a membership of 640 physicians, which is an extremely large proportion when it is

realized that probably not over 900 men could qualify as pathologists in this country. A number of these pathologists are engaged exclusively in teaching and institutional work.

Some of the principal purposes of the American Society of Clinical Pathologists are:

1. To improve the status of pathologists in hospitals, with the hope that the practice of medicine in this field by hospitals will be suppressed;

2. To influence practitioners of medicine to utilize the clinical pathologist as a consultant and to recognize that he has special training, knowledge and skill which most clinicians do not possess and which is essential for the proper care of patients;

3. To educate the public to the usefulness in the community of the functions of physicians who specialize in clinical pathology;

4. To define the functions of state board of health laboratories and restrict their practice to purely public health fields;

5. To make the practice of pathology sufficiently remunerative so that it will attract young, well trained men into the field, that pathology may develop its full usefulness.

For many years pathologists have clearly recognized that their field of medicine is the one through which most forms of corporate medical practice, state medical practice and many forms of socialized medicine would enter. Like roentgenology, many of the tools utilized by the pathologists are mechanical devices and the nature of the specialty demands the hands of many technical assistants. This has made it possible to use the field of pathology as an entrance for many schemes which have retarded the development of this specialty so that it has not reached the same degree of development as have many other medical specialties. To be sure, the origin of this difficulty took place before physicians began to specialize in this field. The early recognition of the paramount importance of the laboratory in the control of contagious diseases, and the obligation of states and the federal government in their control, automatically placed a certain part of the field of laboratory medicine in the hands of the state departments of health.

Pathologists today do not doubt the necessity for the control of contagious diseases by state and federal governmental agencies, nor do they object to the proper expansion of governmental laboratories in fields in which public health control measures are involved. On the other hand, pathologists do oppose the improper expansion of this service to include the medical care, from a laboratory standpoint, of individuals whose illness is not of public health concern and where services are rendered without regard to the ability of the patient to pay for such services and are rendered at taxpayers' expense. No one has any quarrel with provisions for laboratory service to those unable to pay, but one may here even question the premise that this service is always best rendered by a state board of health laboratory. The results of the studies of the Committee on the Evaluation of Serodiagnostic Methods for Syphilis reveal that 62 per cent of state department of health laboratories in this country are as yet incapable of performing satisfactorily tests for syphilis. Pathologists oppose the practice of pathology by laymen. It has previously been established that pathology is a medical specialty, now recognized as such by the American Medical Association, and its practice by any one not licensed to practice medicine is not only detrimental ultimately to the public but is actually illegal.

It is heartening to pathologists to observe the zeal with which the American Medical Association has fought against laymen who practice medicine in opposition to other branches of medicine and has even invited litigation by them. If the practice of pathology by those unlicensed to practice medicine continues to grow as it has in the past, physicians will be forced to abandon the field. The growth of pathology demands that capable young physicians enter the field and, unless satisfactory inducements are provided, few will elect this specialty.

While the expansion of the functions of the state board of health laboratories has been realistically studied for many years by the American Society of Clinical Pathologists, their importance in curtailing the work of private practitioners of pathology has been emphasized by recent developments of the program of the United States Public Health Service. The situation has become more acute recently by the issuance of Supplement 10 of the United States Public Health Service, entitled "Control of the Venereal Diseases in the United States." It is no secret

that the government exercises strong control on the actions of state boards of health, and through its regulations and methods of approval of grants-in-aid and appropriations to these boards it can and does enforce its desires on the methods and services of such boards.

Supplement 10 at first reading does not contain conflicting statements in regard to laboratory service, and evidence indicates that most state boards of health and certainly nearly all officials of the federal government are interpreting paragraphs 2 and 3 of section XV on the basis of paragraph 3:

2. The state laboratory and any local laboratory receiving funds under this act shall provide laboratory services for the venereal diseases on the same basis as such service is provided for other communicable diseases. No state department of health shall be entitled to receive payments under this act unless such laboratory services are provided within that state.

3. Free diagnostic and treatment facilities shall be provided by all health departments or clinics receiving funds under this act for (a) the diagnosis and emergency treatment of all patients who apply; (b) all patients referred by a private physician either for continued treatment or for consultative advice and opinion; and (c) all patients unable to afford private medical care. The determination of the ability of patients to pay for private medical care shall be the responsibility of the state or local health department or constituted welfare agencies within these areas. Clinics collecting fees from semi-indigent patients shall not receive assistance under this act unless such fees are used solely by the venereal disease clinic for improvement of diagnostic and therapeutic services rendered therein.

If this interpretation is generally followed, it will result in such a curtailment of private and hospital pathologic laboratories that many will have to be abandoned and the curious phenomenon will result of pathologists contributing taxes to force themselves out of earning a livelihood. This is not, however, the major consideration. The loss of widely distributed pathologic laboratories and their services would be a definite detriment to all concerned, including the patient. If it be established that the state board of health laboratories can take over this branch of medicine, there is no logical reason why it cannot and will not invade all branches of medicine. Pathologists have from time to time called attention to this fact and it is with some satisfaction, yet apprehension and regret, that this prediction is beginning to be realized by all physicians.

Owing to the efforts of certain members of the Kansas State Board of Health, a new interpretation of these quoted paragraphs in Supplement 10 has been exposed and a letter from Dr. R. A. Vonderlehr, Assistant Surgeon General in charge of the Division of Venereal Diseases, has approved this new interpretation. This interpretation follows the literal wording of paragraph 2, which places the laboratory service for the control of venereal diseases on the same basis as such services for other communicable diseases. Since state laboratories generally have extended these services to embrace a great variety of laboratory tests, without regard to the ability of persons to pay, at first sight this new interpretation appears not to alter current practices of state board of health laboratories. Nevertheless, it provides a means whereby a radical correction of the state board of health practices is now possible and feasible. The Kansas State Board of Health acted immediately following the approval of this policy by the United States Public Health Service. The board passed the following resolution:

The Kansas State Board of Health hereby instructs the state laboratories to furnish laboratory service for diagnosis of all communicable diseases at public expense to all state and county board of social welfare clients, at public expense to all state and county board of social welfare clients, at public expense to all state and county board of social welfare clients; to all inmates or patients of social types of public assistance clients; to all inmates or patients of federal, state, county, or municipal institutions and homes; and to all other residents of the state of Kansas who find it difficult or impossible to pay the costs of laboratory service of this kind in the usual and customary manner.

In order to assist in the provision of this service, the Board has approved the following request form, which will be placed in use effective Jan. 2, 1940:

REQUEST FOR SPECIMEN EXAMINATION BY THE KANSAS STATE BOARD OF HEALTH LABORATORY

I do hereby certify that it will be difficult or impossible for
..... of (county)
(name) (street) (city)
to pay for this examination in the usual and customary manner. I
request therefore that this test be made for me without charge by the
Kansas State Board of Health Laboratory.
(Physician's signature).....

(Technical data in regard to test on reverse side of card.)
The Board also instructs the State Laboratories to provide laboratory service, at public expense and without requirements of request forms, to all county and city health officers, all employees of the Kansas State Board of Health and all staff members of federal, state, county and municipal institutions and homes who desire to utilize the services of the state laboratories in conjunction with their official duty.

The Board feels, however, that it should not provide services of this kind at taxpayers' expense to persons able to provide for themselves. Since for practical reasons the Board must leave the determination of this question to the physicians of the state, it respectfully requests the cooperation of all physicians in making certain that state laboratory services are furnished only to persons within the above approved categories. All regulations in conflict herewith are revoked.

After the adoption of this resolution by the Kansas State Board of Health, the following letter was sent to Dr. F. P. Helm, secretary of the State Board of Health of Kansas, by Dr. R. A. Vonderlehr, Assistant Surgeon General, United States Public Health Service:

Federal Security Agency
U. S. PUBLIC HEALTH SERVICE
Washington, D. C.

Nov. 29, 1939.

Dr. F. P. Helm, Secretary
State Board of Health
Topeka, Kansas
Dear Doctor Helm:

I have your letter of November 23d and the copy of the resolution which was passed by the Kansas State Board of Health at a special meeting held November 22d.

The action taken by the Board places laboratory tests for venereal diseases in the state of Kansas on the same basis as such services are provided for other communicable diseases, and meets the letter of the Surgeon General's Regulations Governing Allotments and Payments to the States for Venereal Disease Control Activities for the Fiscal year 1940, as set forth in paragraph 2, section XV.

Sincerely yours,
R. A. VONDERLEHR,
Assistant Surgeon General,
Division of Venereal Diseases.

Many plans have been proposed to curtail the expansion of state laboratories, but in the opinion of the Executive Committee of the American Society of Clinical Pathologists the resolution adopted by the Kansas State Board of Health and approved by the United States Public Health Service is the most practical plan yet presented, and, if followed in the spirit in which it was adopted, it would do much to clarify the relation of private practitioners of pathology to state board of health laboratories.

The American Society of Clinical Pathologists respectfully requests the Board of Trustees of the American Medical Association to extend its good offices in suppressing the practice of laboratory medicine by laymen and to use its strong influence toward establishing a proper relationship between state board of health laboratories and physicians who practice pathology, using as a basis for action the resolution recently passed by the Kansas State Board of Health. Such an effort on the part of the Board of Trustees of the American Medical Association would be consistent with its activities with regard to the practice of other specialties in medicine.

L. W. LARSON, Bismarck, N. D.,
President.
T. B. MAGATH, Rochester, Minn.,
Chairman of Executive Committee.
A. S. GIORDANO, South Bend, Ind.,
Secretary-Treasurer.
W. M. SIMPSON, Dayton, Ohio,
Member of Special Committee.

GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

GEORGIA

During the past, several agencies in Georgia have been interested in graduate medical education. At times these groups have carried on their work independently and at other times they have participated in cooperative programs. As the history of these groups is interrelated, the complete story of their independent efforts is best told separately with comments on combined efforts that have been successful.

EMORY UNIVERSITY SCHOOL OF MEDICINE

In 1919 the Georgia Department of Public Health in cooperation with Emory University School of Medicine instituted an annual one week clinic, which was devoted primarily to lectures and conferences on venereal diseases. In 1922 the Alumni Association of the school joined in this enterprise and added the clinics in general medicine and surgery. These clinics have continued to the present and are now given during the week preceding commencement.

In July 1926 the school of medicine gave a two weeks course of instruction for physicians in general medicine and surgery. After this course had been given for a number of years, it was finally discontinued. In 1930 the departments of medicine and surgery cooperated with the Negro physicians of Atlanta in organizing one medical and one surgical conference for them each month. Negro physicians participated actively in these conferences. Patients from the Negro division of the Grady Hospital were presented with their case histories, which were discussed by members of the medical faculty. Special emphasis was placed on the diagnostic and therapeutic procedures available in the hospital. These conferences were continued for three years and were apparently well attended by about half of the Negro physicians of the city. They have since been discontinued.

In June 1930 the department of obstetrics and gynecology offered a six day postgraduate course to Negro physicians of the state. The Julius Rosenwald Fund aided by providing traveling expenses and a stipend for those who enrolled. About fifty Negro physicians from various parts of the state attended. In August 1931 a similar six day course was given under the same auspices and was as well attended.

In July 1935, with the financial cooperation of the Julius Rosenwald Fund, the department of pediatrics offered a five

day course to a limited number of Negro physicians of the state. Those who attended were given a daily allowance. This effort was repeated in 1936 and the attendance was again limited to twelve physicians.

UNIVERSITY OF GEORGIA SCHOOL OF MEDICINE

In a report on extension courses offered to practicing physicians in Georgia during the 1924-1925 session, the dean of the school of medicine stated that it was the purpose of the school to put its facilities at the disposal of the alumni and of all other physicians in the state who cared to avail themselves of them. This was part of the university's plan to stimulate statewide interest in the school of medicine. Clinics were conducted also in a number of towns conveniently located throughout the state. Members of the medical school faculty gave lectures preceding these clinics, and physicians practicing in the locality participated in the conduct of the clinic. About 1928 Emory University School of Medicine joined with the University of Georgia in the conduct of these clinics. Arrangements were made whereby members of the faculties of both schools participated.

In 1932 the state board of health assumed the responsibility for arranging these extension programs. In 1934 the Extension Division of the University of Georgia assumed sponsorship of the clinics on behalf of the university's school of medicine. At this time it was decided to include the Medical Association of Georgia, so as to indicate to the profession throughout the state that the association approved of the program. The state department of health requested county medical officers to arrange meeting places. At this time the state was divided conveniently, with each school responsible for its own geographic area.

In 1935 the School of Medicine of Emory University was not represented in the extension clinics. In 1936 it was decided that the initiative for future graduate clinics must come from the communities in which they were to be held. A committee was appointed by the Medical Association of Georgia to assume this responsibility and the state department of health discontinued initiating plans for such clinics.

Each year since 1936 the University of Georgia, with the assistance of the Julius Rosenwald Fund during the first two years, has given a one or two weeks course in general medicine, surgery, pediatrics and obstetrics for Negro physicians at the

medical school. Lectures, ward rounds and clinics for small groups, clinical pathologic conferences and x-ray demonstrations are included. In 1939 patients were assigned to student physicians for the first time. Members of the faculty of medicine supervised the instruction and assumed responsibility for the course. Attendance has ranged from twenty-five to fifty. Additional instruction has been requested in essential laboratory procedures, physical diagnosis and clinical pathology.

OTHER GRADUATE ACTIVITIES

In January and February and in October and November 1939 the state department of public health held a series of two meetings in each of nine and ten localities of the state respectively. The meetings were given under the auspices of the local county medical society in each section. Four speakers who were members of the department of public health conducted the programs. Subjects included were laboratory aids, obstetrics, tuberculosis, venereal diseases including congenital syphilis, and cancer. Three hundred physicians practicing in ninety-two counties attended the first series and 217 from seventy-one counties attended the second series.

The Atlanta Graduate Medical Assembly held its first annual four day session in 1938. This assembly is sponsored by the Fulton County Medical Society and is administered by an executive committee of this society. The first year the county society underwrote the program, but since then this has not been necessary. From fourteen to sixteen guest speakers are invited each year to speak on subjects of general interest. The lectures and exhibits are held in a local hotel. A registration fee of \$5 is charged; interns and medical students are admitted without charge. Commercial exhibits aid in financing. Total attendance has ranged from 400 to 580.

MEDICAL ASSOCIATION OF GEORGIA

At the 1939 annual session of the Medical Association of Georgia, the committee on postgraduate medical education submitted a report which was essentially as follows:

It is felt that postgraduate instruction, in order to be effective, should be conducted in connection with the two medical schools of the state. It is thought that such instruction should be given to small groups or to individuals by special arrangement. Individual instruction in hospital wards might include a study of several subjects. Small group instruction is believed to be more desirable for student physicians than didactic talks to large groups. Four postgraduate centers might be established where clinical facilities are known to be adequate. Occasionally extension work in other communities might be worthwhile. The necessity of the state association appropriating adequate funds for financing a statewide program is emphasized.

The House of Delegates of the Medical Association of Georgia in July 1939 published the following statement on postgraduate study:

As there are several agencies in the state engaged in postgraduate work and no cooperation between them, all state agencies are requested to coordinate their work and organize their activities under one group.

In January 1939 the chairman of the postgraduate committee, Dr. G. Lombard Kelly, notified all county medical societies in Georgia of the action of the house of delegates at its 1936 session, which called for the initiation of extension teaching programs by county societies. The chairman reported that the state medical association was prepared to conduct courses and hold clinics in various parts of the state whenever requested to do so. It had been recommended earlier that programs should center around local hospitals, utilizing patient clinics for demonstration of new diagnostic, including laboratory, procedures. Under this plan, instructors would not be limited to members of faculties of medicine.

Of the 2,756 physicians licensed in the state, 1,938 were members of the Medical Association of Georgia.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—S. 2284 has been reported to the House, with recommendation that it pass, proposing to authorize the President to appoint 100 acting assistant surgeons for temporary service in the Medical Corps of the Navy.

Bills Introduced.—S. 3350, introduced by Senator McCarran, Nevada, and H. R. 8437, introduced by Representative White, Idaho, propose to authorize the President through the agency of the Director of the Geological Survey, Department of the Interior, to provide for employing unemployed citizens in the discovery and development of the mineral resources of the public lands of the United States and to provide for furnishing the persons so employed with such subsistence, clothing, medical attendance, hospitalization, transportation if deemed expedient, and cash allowance, as may be necessary during the period they are so employed. S. 3323, introduced by Senator McNary, Oregon, proposes to provide pension benefits for certain Spanish-American War veterans equivalent to those granted to Civil War veterans. S. 3365, introduced by Senator Murray, Montana, proposes to amend the Social Security Act in several particulars. One proposed amendment would bring within the coverage of the act service performed in the employ of a corporation, community chest, fund or foundation, organized and operated exclusively for religious, charitable, scientific, literary or educational purposes, or for the prevention of cruelty to children or animals. Corporations, community chests, funds or foundations organized and operated exclusively for religious purposes will remain exempted from the requirements of the act, if the bill should be enacted. H. R. 8233, introduced by Representative Knutson, Minnesota, proposes to amend the Social Security Act so as to exempt from its provisions service performed in the employ of a voluntary employees' benefit association that provides for the furnishing of medical care and/or hospitalization to the members of such association or their dependents. H. R. 8392, introduced by Representative Ferguson, Oklahoma, proposes that the Farm Security Administration shall be established as a permanent agency within

the Department of Agriculture and that the Reconstruction Finance Corporation be directed to make loans to the Secretary of Agriculture not in excess of an aggregate amount of \$150,000,000 for each fiscal year for the purpose of enabling the Farm Security Administration to carry out the duties devolved on it. H. R. 8394, introduced by Representative Ludlow, Indiana, would authorize the Secretary of the Treasury to cause to be struck a medal of appropriate design with suitable emblems, devices and inscriptions to be determined by the Secretary of the Treasury, or a certificate suitable for framing, to commemorate the faithful nursing of the women who voluntarily offered their services and who served with the Army during the influenza epidemic of 1918. H. R. 8439, introduced by Representative Havenner, California, proposes to authorize a federal appropriation of \$300,000,000 to assist public agencies and nonprofit organizations in safeguarding the health of the nation, not exceeding \$100,000,000 of which is to be devoted to projects for the construction, improvement or operation of hospitals or related facilities. H. R. 8478, introduced, by request, by Representative Rankin, Mississippi, proposes to grant benefits to World War veterans suffering with paralysis, paresis or blindness, or who are helpless or bedridden. H. R. 8493, introduced by Representative Byron, Maryland, proposes to provide pensions, compensation, retirement pay and hospital benefits to certain reserve officers of the Army of the United States. H. R. 8514, introduced by Representative Byrns, Tennessee, proposes to provide for eight-hour shifts for nurses in hospitals on the Canal Zone, Isthmus of Panama.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced.—A. 141 provides that in each school district the medical inspector, or the nurse under his immediate direction, shall make eye and ear tests of the pupils of the schools in the district at least once in each school year. The tests must be made with such scientific devices and under such rules and regulations as may be approved and prescribed by

the state board of education. S. 78 proposes an appropriation of \$15,000 to be expended by the state department of health for the purchase and free distribution of antipneumococcic serum for the treatment of persons affected with pneumonia and financially unable to purchase the serum and for determining the type of pneumococci from persons suspected or known to have pneumonia.

New York

Bills Introduced.—S. 927 and A. 1399 propose to amend the education law of New York in relation to the issuance of medical licenses so as to provide that an applicant who meets the requirements of the law as to preliminary and professional education, who presents evidence of successful practice or professional experience satisfactory to the commissioner of education and who presents evidence satisfactory to the commissioner that he has been duly licensed by proper authority in any other state, territory, district or possession of the United States after passing examinations which were equivalent as to subject matter and standards to those of New York at that time may without further examination, on payment of a fee of \$25 and on submitting such further evidence as the commissioner may require, receive from the commissioner in his discretion an endorsement of his license or diploma conferring all rights and privileges of a license issued by the department after examination. S. 1158 and A. 1420, both introduced at the request of the New York State Temporary Commission to Formulate a Health Program, propose to impose, as a condition precedent to medical licensure, an internship requirement of not less than twelve months in a hospital in the United States or Canada approved and registered as maintaining at the time a standard satisfactory to the commissioner of education and the state board of medical examiners. A. 1373 proposes that every physician shall immediately give notice to the health officer of every case of infantile paralysis under his care, the notice to contain such information concerning the case as shall be required by the state commissioner of health. Like notice

must be given by the person in charge of any hospital, dispensary, asylum or other similar public or private institution. The bill also proposes to create in the state department of health a division of infantile paralysis control and the commissioner of health through this division is directed to continue to conduct investigations of the cause, mortality rate, methods of treatment, prevention and cure of infantile paralysis and allied diseases, including the nature and extent of the facilities available in the several counties and cities of the state, for the diagnosis and treatment of these diseases, and is further directed to cooperate with local health authorities, physicians, hospitals, clinics and voluntary associations, in the development of suitable facilities for the diagnosis, treatment and control of infantile paralysis.

Virginia

Bills Introduced.—House Joint Resolution 28 proposes to create a commission consisting of five members, one to be a member of the senate, two to be members of the house of delegates and two to be appointed by the governor from the citizens at large to (a) study rural health conditions in Virginia, (b) study the adequacy and cost of medical and hospital care available to rural people, (c) analyze the various programs for providing clinics and preventive medical service in Virginia in comparison with what is being done in these fields in other states, (d) analyze the applicability of various plans for health, medical and hospital care and insurance to rural Virginia, and (e) recommend ways and means of providing more adequate health, medical and hospital care for rural people in Virginia. In carrying out its functions, the commission is to be authorized to enlist the aid of the Medical Society of Virginia, the Virginia State Dental Association, the Virginia State Department of Health and certain other named agencies and organizations. The commission is to be required to submit its report and recommendations to the governor and to the members of the general assembly on or before July 1, 1941.

OFFICIAL NOTES

THE NEW YORK SESSION

American Physicians' Art Association

The American Physicians' Art Association will hold its annual exhibit, June 9-15, during the time of the annual session of the American Medical Association in New York. The headquarters of the physicians' art association will be located in a booth, which Mead Johnson & Co. has donated, on the third floor of the technical exhibits at the Grand Central Palace on Lexington Avenue. In this booth, which will be 27 by 30 feet with the entire front open, will be placed some of the extraordinary art objects in the exhibit. The booth is number 303A. In addition, the entire top floor—exhibit hall, banquet room, roof gardens, piazzas—of the Belmont-Plaza Hotel, which is across the street from the Waldorf Astoria Hotel, will be turned over to the American Physicians' Art Association. The New York Physicians' Art Club will act as host. The eighteen California Rhythm Doctors will



make a special trip to New York to play at the banquet of the art association at the Belmont-Plaza, Wednesday night, June 12. The members of this orchestra, in addition to being expert instrumentalists, are also singers, comedians and specialty artists. Dr. Hannibal De Bellis, 316 West Eighteenth Street, New York, is chairman of the dinner committee. Many prizes have been donated for the prize-winning exhibits. The \$1 dues for this season should be mailed at once to the treasurer of the association, Dr. Raleigh W. Burlingame, San Francisco Hospital, San Francisco. Details of the exhibit plans and other arrangements may be obtained by writing to the president of the American Physicians' Art Association, Dr. Henry N. Moeller, 327 Central Park West, New York, or to the chairman of the arrangements committee, Dr. Abraham Wolbarst, 114 East Sixty-First Street, New York.

NATIONAL CONFERENCE ON MEDICAL NOMENCLATURE

On March 1, at the Headquarters Office of the American Medical Association, there will be a Conference on Medical Nomenclature designed to bring out discussion on a number of important problems connected with terminology. The program is as follows:

NATIONAL CONFERENCE ON MEDICAL NOMENCLATURE

535 North Dearborn Street, Chicago

March 1, 1940

HAVEN EMERSON, M.D., CHAIRMAN

PROGRAM

1. Trends in Medical Terminology.....Morris Fishbein, M.D.
2. Purposes, Function and Use of Standard Classified Nomenclature of Disease.....George Baehr, M.D.
3. International Nomenclature and the International List of Causes of Death.....Halbert L. Dunn, M.D.
4. A Standard Nomenclature of Operations.....H. Perry Jenkins, M.D.
5. The Adaptation of the Standard Classified Nomenclature of Disease to Hospital Morbidity Reports.....E. H. L. Corwin, Ph.D.
6. Punch Cards and Tabulating Methods as Applied to Morbidity Reports.....Mrs. Stella F. Walker
7. Massachusetts Experience in Reporting Mental Disorders
Neil A. Dayton, M.D.
8. The Classification of Tumors for Clinical Purposes—
Preliminary Report.....Bowman C. Crowell, M.D.
9. Progress Report on Revision of the Standard Classified Nomenclature of Disease.....Edwin P. Jordan, M.D.
10. Problems of Terminology in the Field of Physical Medicine.....Frank H. Krusen, M.D.
11. Nomenclature and Classification of Allergic Disorders
Samuel M. Feinberg, M.D.
12. Problems of Dermatologic Nomenclature.....Howard Fox, M.D.
13. Terminology in Diseases of the Blood-Forming Organs
Raphael Isaacs, M.D.
14. Diseases of Endocrine Origin.....Elmer L. Seyringhaus, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Hospital News.—The psychiatric department of Mount Zion Hospital, San Francisco, announces a series of four discussions on psychotherapy in general practice as follows: March 6, "History of Psychotherapy"; March 13, "Essence of Therapeutic Relationship"; March 20, "Modern Treatment of Neuroses," and March 27, "Psychotherapy in Children."

Clinical Conferences and Postgraduate Courses.—The committee on postgraduate activities of the California Medical Association is sponsoring clinical conferences and postgraduate courses throughout the state under the auspices of the local county medical societies. One will be held in Bakersfield on March 16 by the Kern County Medical Society. At the clinical conferences in Fresno on February 2, 9 and 16 the speakers were Drs. Garnett Cheney, San Francisco, and Edmund W. Butler, San Francisco, on peptic ulcers and pneumonia, respectively; Ernest W. Page, Berkeley, some problems in gynecology and obstetrics, and Clark M. Johnson and Edgar A. W. Wayburn, San Francisco, genito-urinary and venereal diseases and disorders of nutrition, respectively. The Fresno County Medical Society was host. A symposium on gastrointestinal diseases constituted the course before the Santa Cruz, San Benito and Monterey county medical societies, February 1, in Salinas; the speakers were Drs. Fred H. Kruse, David A. Wood and Eric Liljencrantz, San Francisco.

GEORGIA

Emergency Station Dedicated as Memorial to Physician.—An American Red Cross Emergency Station on the Dawson-Shellman highway was dedicated recently to the late Dr. Albert Leroy Crittenden, Shellman, who died, Jan. 25, 1934. Dr. Crittenden once served as president of the Randolph County Medical Society. This is the second of three stations to be dedicated to Randolph County physicians, newspapers reported. The others are in honor of Drs. George V. Moore and Frederick D. Patterson, Cuthbert. Included among the speakers at the Shellman dedication was Dr. Job C. Patterson, Cuthbert, president of the state medical society.

ILLINOIS

Handbook on Pneumonia.—A handbook on pneumonia has been published by the state department of health and is available free to physicians in Illinois who send requests to the department at Springfield or to the committee on education of the Illinois State Medical Society, 30 North Michigan Avenue, Chicago. Prepared by the state advisory committee on pneumonia control, the booklet contains in brief but comprehensive form specific, up-to-date information on the diagnosis and treatment of the pneumonias. The technic of utilizing various therapeutic measures is included.

New Assistant Director of Health.—Dr. Roland R. Cross, Dahlgren, superintendent of the health district in Southern Illinois since 1933, has been appointed assistant director of the Illinois State Department of Health. Dr. Cross graduated at the American Medical College, St. Louis, in 1912. He spent six years in Indian work as a member of the U. S. Public Health Service and served in the World War. He was president of the Jefferson-Hamilton Counties Medical Society in 1931. The position to which Dr. Cross has been appointed has been vacant since 1937, when Dr. Albert C. Baxter, Springfield, present health director, was named acting director of the department.

New Mental Hygiene Post Created.—Dr. Conrad S. Sommer, Chicago, director of the Illinois Society for Mental Hygiene, has been appointed to the newly created post of state superintendent of the division of mental hygiene, the Chicago Tribune reports. The new division is in the state department of public welfare and was created on the recommendation of the Institute of Medicine of Chicago. Dr. Sommer has taken a year's leave of absence from the society of mental hygiene. In his new capacity he will supervise medical care and treatment of the 30,000 patients in the ten state mental institutions, and will be responsible to the state alienist. Dr. Sommer graduated at the University of Illinois College of Medicine in

1932. He was resident psychiatrist at the Illinois Research Hospital from 1932 to 1933 and fellow at the Institute for Juvenile Research from 1935 to 1937. For the last three years he has been connected with the Illinois Society for Mental Hygiene and assistant clinical professor of psychiatry at Loyola University School of Medicine.

Chicago

Hospital News.—Dr. Carl J. Wiggers, professor of physiology, Western Reserve University School of Medicine, Cleveland, lectured at Michael Reese Hospital February 6, on "Characteristics and Variations in Normal Heart Sounds." The lecture was under the auspices of the cardiovascular group.

Session on Venereal Diseases.—The venereal disease commission of the Chicago Medical Society has planned a program, February 28, to further its policy of utilizing the clinical material of the Municipal Social Hygiene Clinic. Dr. Bell F. Korman, chief of the department of syphilis in childhood at the clinic, will present an outline of the treatment of syphilis in childhood, with a statistical report of the results of 800 cases and a demonstration of juvenile tabes, dementia paralytica and syphilitic keratitis. Discussions will be offered by Drs. Noel G. Shaw, Isador M. Levin and Harold A. Rosenbaum. The meeting will be held at the social hygiene clinic.

Dr. Irving S. Cutter Honored.—Robert R. McCormick, editor and publisher of the Chicago Tribune, has given the property at the northwest corner of Lake Shore Drive and Pearson Street to Northwestern University "for the purpose of establishing and maintaining a fund, the income from which is to be spent for research in the medical school." The fund is to be called the "Irving S. Cutter Fund for Medical Research," in honor of the dean of the medical school, who is also health editor of the Tribune. Dr. Cutter has been dean since 1925 and medical director of Passavant Hospital since 1928.

Branch Meetings.—Dr. George K. Fenn discussed "Electrocardiography" before the Southern Cook County Branch of the Chicago Medical Society recently. At a meeting of the Irving Park Branch, January 16, Dr. Frederick H. Falls discussed "Indications and Technic of Cesarean Section." Dr. Italo F. Volini addressed the Jackson Park Branch, January 18, on "The Modern Treatment of Pneumonia." The West Side Branch was addressed by Dr. Joseph F. Jaros, January 18, on "Electrocoagulation." At a joint meeting of the Chicago Medical Society and the Stock Yards Branch, January 18, the speakers were Drs. Bert I. Beverly and Julius H. Hess on "Problems of Adolescence" and "Infant Feeding as We See It Today." The Calumet Branch devoted its January 19 meeting to a symposium on diseases of the stomach. Dr. George E. Wakerlin addressed the Northwest Branch, January 19, on "The Pathogenesis and Therapy of Non-Nephritic Hypertension." Dr. Michael L. Mason discussed "Treatment of Open Wounds" before the South Chicago Branch, January 23.

INDIANA

Society News.—The Fountain-Warren County Medical Society was addressed in Covington, February 1, by Drs. Wemple Dodds, James M. Kirtley and George A. Collett, Crawfordsville, on "Toxemia of Gestation: Its Pathology, Diagnosis and Treatment."—At a meeting of the Dearborn-Ohio County Medical Society in Lawrenceburg, February 1, Dr. Louis P. Stickley, Cincinnati, discussed jaundice.

IOWA

Physician Honored.—The Eldora community award, sponsored by the American Legion post, was presented to Dr. Joseph R. Winnett in January. No public demonstration was made at the time because of the illness of Dr. Winnett. A graduate in 1912 of Drake University College of Medicine, since absorbed by the State University of Iowa College of Medicine, Dr. Winnett has been practicing in Eldora since 1914, except when he was a medical officer at Camp Pike near Little Rock, Ark., during the World War. The award is a silver loving cup.

KANSAS

Society News.—Dr. Ward Darley Jr., Denver, discussed chronic undulant fever before the Shawnee County Medical Society in Topeka, February 5.—The Wyandotte County Medical Society was addressed, February 6, by Dr. Paul M. Krall, Kansas City, on "Essential Factors in the Production of Edema." The society was addressed, February 20, by Drs. Tom R. Hamilton, Kansas City, on "The Thymus Gland (A Study of 7,500 Autopsy Cases)" and William J. Feehan,

Kansas City, spondylolisthesis. At a meeting, January 16, the speakers were Drs. Elden S. Miller and LaVerne B. Spake, Kansas City, on "Complications of Diabetes" and "Diagnosis and Treatment of Deafness" respectively.

MASSACHUSETTS

Personal.—Dr. Ernest M. Morris, formerly health commissioner of Fall River, has been appointed district health officer for all of Hampden County and most of Hampshire County in the western part of the state, with offices in Westfield, it is reported. He succeeds Dr. Charles E. Gill.

Dr. Keefer Named Wade Professor of Medicine.—Dr. Chester S. Keefer, associate professor of medicine, Harvard Medical School, Boston, has been appointed Wade professor of medicine at Boston University School of Medicine, effective on February 1. Dr. Keefer graduated at Johns Hopkins University School of Medicine, Baltimore, in 1922, serving on the staff from then until 1926. The subsequent two years he was a member of the faculty of the University of Chicago, going to Peiping Union Medical College, Peiping, China, in 1928. He was at Harvard from 1930 until his recent appointment. Dr. Keefer succeeds Dr. Reginald Fitz, who plans to engage in private practice.

Society News.—Dr. Edward J. O'Brien Jr., Boston, addressed the Wachusett Medical Improvement Society in Worcester, February 7, on "Surgical Treatment of Prostatic Obstruction."—Dr. Samuel A. Levine, Boston, discussed "A Routine Office Cardiovascular Examination" before the Worcester District Medical Society in December. Among others, Dr. George W. Ballantyne, Worcester, addressed the society, January 10, on "Diabetes and Pregnancy."—Dr. Chester M. Jones, Boston, discussed "Substernal Pain, a Confusing Symptom: Its Clinical Significance" before the Hampden District Medical Society in Springfield, January 23.—Dr. James W. Sever, Boston, will address the Pentucket Association of Physicians March 14 on "Recent Advances in Orthopedic Surgery."

MICHIGAN

Changes in Health Officers.—Dr. Robert F. Hall, Mason, assistant medical director of the health unit in Ingham County, has been appointed in charge of the unit in Bay City. Dr. Lorin E. Kerr Jr., Charlotte, has been named to succeed Dr. Hall in Ingham County. Dr. Hall is the first full time health officer in Bay City, succeeding Dr. George W. Moore, who held the office on a part time basis for fifteen years, it is reported.

Society News.—Dr. James H. Mitchell, Chicago, addressed the Wayne County Medical Society, February 12, on "Differential Diagnosis of the Cutaneous and Mucous Membrane Lesions of Syphilis."—At a meeting of the Jackson County Medical Society in Jackson, January 16, a symposium on "Michigan Medical Service and Medical Welfare Relief" was presented by Dr. Henry R. Carstens, Detroit; Dr. L. Fernald Foster, Bay City; William J. Burns, LL.B., Lansing, and Mr. J. D. Laux, Lansing.

New Building for Dental Research.—The new W. K. Kellogg Foundation Institute for Graduate and Postgraduate Dentistry will be dedicated in Ann Arbor, April 3. The speakers will include Dr. Clarence O. Simpson, St. Louis, whose address will be on radiology. A memorial will be unveiled in honor of Willoughby D. Miller, American dentist (1853-1907). By a series of experiments beginning about 1880, Dr. Miller demonstrated the essential relation between mouth bacteria and decay of the teeth. He showed that a dissolution of the lime salts in dentin was caused by acid elaborated by microorganisms. He produced caries in the laboratory. His work was summarized in a book published in 1890, entitled "Micro-Organisms of the Human Mouth."

MINNESOTA

New Director of School Hygiene.—Dr. Arthur E. Karlstrom has been appointed director of school hygiene and health of Minneapolis. He succeeds Dr. Malvin J. Nydahl, who resigned to become head of the bureau of crippled children, state division of social welfare. Dr. Karlstrom graduated at the University of Minnesota Medical School in 1936. He discussed "Peritonitis Secondary to the Appendix" before the Hennepin County Medical Society, Minneapolis, February 5.—Dr. Willard O. Thompson, associate clinical professor of medicine, Rush Medical College, Chicago, gave a Mayo Foundation lecture in Rochester, January 18, on "Hypogenitalism in the Male."

MISSOURI

Physician Honored.—The Dallas-Hickory-Polk County Medical Society held a special meeting and banquet in Bolivar recently to honor Dr. Joseph F. Roberts, Bolivar, on his eighty-ninth birthday. Dr. Roberts has practiced medicine for sixty-seven years, sixty-two of them in Bolivar; he still goes to his office each day, according to the state medical journal. Dr. Homer L. Kerr, Crane, was toastmaster at the dinner and Dr. James R. McVay, Kansas City, president of the state medical association, gave the principal address. About seventy-five physicians and their friends attended. Dr. Roberts graduated at Missouri Medical College in 1877.

Society News.—Dr. Robert Elman, St. Louis, addressed the Kansas City Academy of Medicine, January 19, on "Surgical Aspects of Protein Metabolism." Dr. Wallace M. Yater, Washington, D. C., addressed the academy, February 16, on "Late Advances in the Study of Diseases of the Blood Vessels."—Dr. George Wilse Robinson Sr., Kansas City, addressed the Lawrence-Stone County Medical Society, January 16, on "Newer Methods of Treatment of the Psychoses."—The speakers before the South Central Counties Medical Society in West Plains, January 11, were Drs. George W. Hogeboom, Springfield, on "Changing Trends in the Surgical Treatment of Gallbladder Disease"; Francis B. Camp, Springfield, "Sulfanilamide and Its Derivatives," and William J. Gonorrhea, "Use of Sulfanilamide in the Treatment of"

NEW YORK

Eastman Lecture.—Philip E. Smith, Ph.D., professor of anatomy, College of Physicians and Surgeons, Columbia University, delivered the Eastman Memorial Lecture at the University of Rochester School of Medicine on January 23. His subject was interrelationship between the hypophysis and the reproductive system.

Food Poisoning from Sodium Fluoride.—An outbreak of sixty-nine cases of food poisoning at a state institution for adolescent and young adult males on December 26 was traced to contamination with sodium fluoride used to kill roaches. The illness occurred among 143 inmates who had luncheon half an hour earlier than the remaining 488. The onset was sudden, most of the victims having developed symptoms within ten minutes after the meal. Chocolate pudding was immediately suspected and another dessert was substituted for the remainder of the luncheon. None of those who ate later became ill. Samples analyzed in the laboratories of the state department of health were found to contain from 0.1 to 0.3 per cent of sodium fluoride.

New York City

Twenty-Fifth Class Reunion.—The twenty-fifth reunion of the class of 1915 of New York University College of Medicine will be held at Delmonico's, Saturday, May 11. Further information may be obtained from Dr. Henry M. Scheer, 522 West End Avenue, president.

Doctors' Orchestra.—The Doctors' Orchestral Society of New York now has headquarters at the National Hospital for Speech Disorders, through the interest of the medical director, Dr. James Sonnett Greene. The auditorium and other rooms have been placed at the disposal of the orchestra and other rooms in the home and the first rehearsal was held there on January 18.

Professor Appointed.—Dr. Howard W. Potter, professor of clinical psychiatry, College of Physicians and Surgeons of Columbia University, has been appointed clinical professor in the department of neurology and psychiatry at Long Island College of Medicine. Dr. Potter graduated at Columbia in 1913. He served as assistant physician at Bloomingdale Hospital (now the New York Hospital, Westchester Division) from 1916 to 1920, and at Hudson River State Hospital from 1920 to 1921. From 1921 to 1929 he was clinical director at Lettsworth Village, Thiells, and for the next five years was assistant director of the New York State Psychiatric Institute and Hospital. Since 1934 he has been attending psychiatrist at the Neurological Institute and consulting psychiatrist at Nyack, Englewood and Rockland hospitals. He has been president and secretary of the American Association on Mental Deficiency and is a member of various other special societies.

Society News.—Among speakers at a meeting of the committee on cardiac clinics, New York Heart Association, February 27, will be Drs. Thomas H. McGavack on "Changes in Heart Volume in Addison's Disease and Their Significance"; Paul K. Boyer, "Influence of Digitalis on the Electrolyte and"

MEDICAL NEWS

JOUR. A. M. A.
FEB. 24, 1940

PENNSYLVANIA

Water Balance of Heart Muscle and Henry A. Schroeder, "Relation of the Intake of Salt and Water to the Edema of Heart Failure."—Speakers before the New York Pathological Society on January 25 were Drs. David H. Goldstein and Irving Graef, on "The Influence of Sulfanilamide and Sulfapyridine upon the Evolution of Experimentally Induced Pneumococcus Pneumonia in Rats," and Cornelius P. Rhoads, on "Aplastic Anemia."—Dr. Henry L. Jaffe addressed the New York Roentgen Society, January 15, on "Findings in Cases Generally Misinterpreted as Cortical Bone Abscess or Sclerosing Osteomyelitis of Long Bones."—A symposium on "Experimental and Clinical Phases of Sex Hormone Therapy" was presented before the section of genito-urinary surgery of the New York Academy of Medicine, January 17, by Drs. James F. McCahey, Philadelphia; Walter M. Kearns, Milwaukee, and Norris J. Heckel, Chicago. Dr. Aaron S. Blumgarten addressed the New York Endocrinological Society, January 24, on "Critical Evaluation of Modern Hormone Therapy."—A symposium on operative treatment of lesions of the chest was presented before the New York Surgical Society on January 24 by Drs. Harold Neuhof, Arthur S. W. Touroff, Arthur H. Aufses, William De W. Andrus and George J. Heuer.

OHIO

Portrait of Dr. Todd.—A portrait of the late Dr. T. Wingate Todd, professor of anatomy at Western Reserve University School of Medicine, Cleveland, was recently presented to the library of the department of anatomy by the Charles Bolton Fund. Birdsill Holly Broadbent, D.D.S., director of the fund, made the presentation on Dr. Todd's birthday, January 15, and President Winfred C. Leutner, LL.D., accepted it. The portrait was painted by Dr. Erich von Baeyer, fellow in roentgenology at University Hospitals.

University News.—The John and Mary R. Markle Foundation has made a grant of \$6,000 to Western Reserve University School of Medicine, Cleveland, to support the research of Dr. Claude S. Beck, associate professor of surgery, on methods of revascularizing the heart after coronary obstruction. The National Research Council made a grant of \$1,250 for a study of human ovulation under the direction of William W. Greulich, Ph.D., professor of physical anthropology and anatomy and director of the Brush Foundation.

New Dean at Cincinnati.—Dr. Stanley E. Dorst, associate professor of medicine and assistant dean of the University of Cincinnati College of Medicine since 1937, has been appointed dean to succeed the late Dr. Alfred Friedlander. He has been acting dean since the death of Dr. Friedlander in May 1939. The new appointment carries with it the positions of chief of staff of the Cincinnati General Hospital and director of the Christian R. Holmes Hospital. Dr. Dorst graduated at Cincinnati in 1923 and became a member of the faculty in 1926.

Personal.—Dr. Clyde L. Smith, Fremont, has been named city health commissioner to succeed Dr. Edgar L. Vermilya, who had served thirty-one years. Dr. William F. Lyons, Coshocton, was recently appointed city health commissioner to succeed Dr. Jacob D. Lower. Dr. Joyce I. Hartman has resigned as supervisor of medical inspection in Cleveland schools to devote his time to private practice. Dr. Carle W. Beane, West Manchester, has been appointed health officer of Preble County to succeed Dr. James I. Nisbet, Eaton, resigned.

Ohio State Annual Assembly.—The Seventh Post-Collegiate Assembly of the Ohio State University College of Medicine, Columbus, will be held March 29-30. Symposia and round table discussions will be held all day March 29 and a program with guest speakers Saturday morning March 30. At noon there will be an alumni reunion luncheon in honor of the new president of the university, Howard L. Bevis, S.J.D. The guest speakers will be:

Dr. Robert M. Zollinger, Boston, Surgical Problems of the Gallbladder and Extrahepatic Bile Ducts.
Dr. Lee C. Gatewood, Chicago, Indications for Surgical Intervention in Peptic Ulcer from the Standpoint of the Internist.
Dr. George E. Rockwell, Cincinnati, Active Immunization to Tetanus by Means of Tetanus Toxoid.
Dr. Roll H. Markwith, Columbus, Survey of Ohio Public Health Situation.
Dr. John H. Warvel, Indianapolis, Protamine and Other Slow Acting Insulins and Their Clinical Application.
Dr. Charles W. Mueller, Brooklyn, Diagnosis and Treatment of Placenta Praevia.

Dr. John H. J. Upham, dean of the college of medicine, will present "An Interpretation of Current Research at Ohio State University."

WISCONSIN

Personal.—Dr. Michael Kasak, acting medical director of the Milwaukee County Asylum for Chronic Insane and the Milwaukee County Hospital for Mental Diseases, was made medical director, January 24. Dr. Kasak was clinical director from 1925 until the resignation of Dr. Albert F. Young, medical director and superintendent, in January 1939 and since that time has been acting head of the two institutions.

Philadelphia

Hospital News.—The Jewish Hospital has opened a department of endocrinology with Dr. Nathan Einhorn as chief and Dr. Leonard G. Rowntree as consultant.

Potter Memorial Lecture.—Dr. Irvin Abell, Louisville, Ky., delivered the William Potter Memorial Lecture at Jefferson Medical College, February 14. His subject was "The Spirit of Medicine."

Society News.—Dr. Marvin Pierce Rucker, Richmond, Va., addressed the Obstetrical Society of Philadelphia, February 1, on "Toxemias of Pregnancy."—Dr. Tom Douglas Spies, Cincinnati, delivered the forty-sixth Mary Scott Newbold Lecture of the College of Physicians of Philadelphia, February 7, on "The Vitamin B Deficiencies."—Dr. Edward B. Krumbhaar addressed the Pathological Society of Philadelphia, February 8, on "The Present Status of Hodgkin's Disease" and Dr. George C. Griffith presented a case of Hodgkin's disease with cardiac involvement.

SOUTH DAKOTA

Personal.—Dr. Antony Triolo, Rapid City, has been appointed director of the division of maternal and child health in the state health department. Dr. George H. Stidworthy, Deersfield, was honored at a community banquet recently in recognition of his forty years of service.

TEXAS

Twelfth Clinical Conference in Dallas.—The twelfth annual spring clinical conference of the Dallas Southern Clinical Society will be held at the Hotel Adolphus, Dallas, March 11-14. The guest speakers, who will deliver several addresses each, will be:

Dr. Marion A. Blankenhorn, professor of medicine, University of Cincinnati College of Medicine.
Dr. Chester S. Keeler, Wade professor of medicine, University of Medicine, Chicago.
Dr. Warren H. Cole, professor of surgery, University of Cincinnati College of Medicine.
Dr. Clay Ray Murray, associate professor of surgery, University of Illinois College of Physicians and Surgeons, New York.
Dr. Tracy B. Mallory, assistant professor of pathology, Harvard Medical School, Boston.
Dr. John W. Harris, professor of obstetrics and gynecology, University of Wisconsin Medical School, Madison.
Dr. Frank E. Adair, associate professor of clinical surgery, Cornell University Medical College, New York.
Dr. Walter A. Fessler, clinical associate professor of surgery, University of Minnesota Medical School, Minneapolis.
Dr. Frank E. Stevenson, associate professor of pediatrics, University of Cincinnati College of Medicine.
Dr. Meredith F. Campbell, professor of urology, New York University College of Medicine.
Dr. Parker Heath, professor of ophthalmology, Wayne University College of Medicine, Detroit.
Dr. Millard F. Arbuckle, assistant professor of clinical ophthalmology, Washington University School of Medicine, St. Louis.

Government Services

Activities of Veterans' Administration

During the fiscal year ended June 30, 1939, there were 165,576 admissions of United States veterans to hospitals and a daily average of 49,147 patients of all types under treatment, according to the annual report of the Administrator of Veterans' Affairs.

The hospital load at the end of the year was 54,117, an increase of about 6 per cent over the preceding year. More than 77 per cent of these veterans were receiving treatment for disabilities not of service origin. Of the total patient load, 48,527 patients were World War veterans. More than 64 per cent were in hospitals in their home states.

According to types of illness they were divided as follows: tuberculosis 9.2 per cent, neuropsychiatric diseases 57.68 per cent, general medical and surgical conditions 33.12 per cent. This distribution is in marked contrast to that of 1923, when 41 per cent were ill of tuberculosis, 39 of neuropsychiatric diseases and 20 of general medical and surgical conditions.

The number of admissions for 1939 was the highest for any fiscal year to date, the administrator reported, and more than 92 per cent were for non-service connected disabilities. Admissions by types of diseases were as follows: pulmonary tuberculosis 11,268, mental diseases 9,372, other neurologic disorders 13,240, and general medical and surgical diseases 131,696.

There were 221,509 patients under hospitalization during the year, an increase of 10 per cent over 1938. Of these 218,621 were United States veterans; the remainder included 1,689 members of the Civilian Conservation Corps and Works Progress Administration, 202 veterans of countries allied with the United States in the World War and 741 miscellaneous beneficiaries.

Of the veterans, 164,760 were discharged after an average of 72.4 inpatient days. About 78 per cent of them had been under treatment for general medical and surgical conditions, 15 per cent for neuropsychiatric diseases and 7 per cent for pulmonary tuberculosis. There were 10,880 deaths, including 7,365 among patients under treatment for general conditions, 1,947 for tuberculosis and 1,568 for neuropsychiatric diseases. About 37 per cent were caused by diseases of the circulatory system, including organic heart disease, and approximately 34 per cent by malignant tumors and diseases of the digestive system.

Veterans present in domiciliary status under control and jurisdiction of the Veterans' Administration totaled 15,426, an increase of 1,172 over the preceding year. General medical and surgical conditions accounted for the disabilities of 10,644 of those under domiciliary care, neuropsychiatric diseases for 4,461 and tuberculosis 321.

At the end of the fiscal year the Veterans' Administration was operating hospital facilities at eighty-four locations in forty-five states and the District of Columbia, with a capacity of 54,779 beds, an increase of 2,788 over 1938. In addition the administration was using 2,748 beds in other government hospitals. There were 16,345 beds set aside for domiciliary care. Construction in progress at the time of the report was to add 9,710 beds, and two other projects providing 206 beds were completed in June, though the beds were not available until after the end of the fiscal year, according to the report. New construction for which funds were available but which had not been placed under contract by June 30 was to provide 1,127 hospital and 465 domiciliary beds. During the twenty years since the first law was passed in 1919, a total of \$200,044,766 has been made available for construction of facilities for veterans.

The net operating expense for all facilities for 1939 was \$53,205,919.47. The per diem cost of operation was \$2.68 for all types of cases. For tuberculosis the cost was \$3.97, for general conditions, \$3.59 and for neuropsychiatric diseases \$1.90.

The administration made a total of 1,127,162 physical examinations for outpatient purposes and furnished 1,079,663 outpatient treatments. Two per cent of the examinations and 9 per cent of the treatments were dental.

The report points out that the administration gives continuous study to introduction of new diagnostic and treatment methods, to renovation or replacement of unserviceable equipment and to the training of personnel. Two special units are considered of particular importance: the cardiovascular unit at the Diagnostic Center in Washington, D. C., and the tumor research unit at Hines, Ill., both of which are conducting important research.

Society News.—Dr. Loyal Davis, Chicago, addressed the Medical Society of Milwaukee County, January 12, on neurologic surgery.—Dr. John A. Bigler, Highland Park, Ill., addressed the University of Wisconsin Medical Society, Madison, January 12, on "Scarlet Fever, the Dick Test and Hemolytic Streptococcus Throat Cultures."—Dr. Matthew N. Federspiel, Milwaukee, addressed the Brown-Kewaunee Door Counties Medical Society in Green Bay, January 11, on "Fractures and Mutilations of the Face."—Dr. Harold E. Marsh, Madison, addressed the Barron-Washburn-Sawyer-Burnett Counties Medical Society, Rice Lake, January 2, on "Cardiac Arrhythmia."—At the annual meeting of the Milwaukee Society of Clinical Surgery, January 30, the speakers were Drs. Karl Schlaepfer, retiring president, on "Short Wave in Surgery"; Lemuel D. Smith, incoming president, "The Mechanics of Fracture," and Stanley J. Seeger, "Treatment of Burns."—The Wisconsin Tuberculosis Society was recently organized with Dr. William H. Oatway Jr., Madison, as president and Arthur A. Pleyte, Milwaukee, as secretary. The first meeting was held on January 24 in Madison.

GENERAL

Annual Meeting of Nutrition Institute.—The American Institute of Nutrition will meet in New Orleans, March 13, at the Jung Hotel. Papers on current research in nutrition will be presented at meetings during the day and a symposium on "Nutrition for the Higher Health" will form the program for an evening meeting. Henry C. Sherman, Ph.D., New York, president of the institute, will preside at the symposium and the speakers will be:

- Elmer V. McCollum, Ph.D., Baltimore, The Problem of Promoting Better Nutrition.
- Dr. John B. Youmans, Nashville, Tenn., The Assessment of the Nutrition of Populations.
- Dr. Tom Douglas Spies, Cincinnati, Pellagra and Associated Deficiency Diseases as a Medical and Public Health Problem.
- Hazel K. Stiebeling, Ph.D., Washington, D. C., Dietary Levels in the United States.

Southeastern Surgeons to Meet.—The eleventh annual assembly of the Southeastern Surgical Congress will be held at the Tutwiler Hotel, Birmingham, Ala., March 11-13. Among the speakers will be:

- Dr. James K. McGregor, Hamilton, Ont., Dysfunction of the Thyroid Gland as a Cause for Premature Old Age.
- Dr. Kenneth K. Sherwood, Seattle, Classification and Treatment of Chronic Arthritis.
- Dr. Louis A. Buie, Rochester, Minn., Management of Anal Fistulas in Office and Hospital.
- Dr. George M. Curtis, Columbus, Ohio, The Rationale of Splenectomy in the Treatment of Certain Anemias.
- Dr. Stuart W. Harrington, Rochester, Minn., Surgical Treatment of Calcified Constricting Pericardium.
- Dr. Roy D. McClure, Detroit, Modern Treatment for Tumors of the Skin.
- Dr. George T. Pack, New York, Diagnosis and Treatment of Malignant Tumors of the Skin.
- Dr. Edwin G. Ramsdell, New York, Prevention of Wound Disruption.
- Dr. Roy B. Henline, New York, Prostatic Disease, with Special Reference to the Various Causes and Types as Well as Their Treatment.
- Dr. Robert H. Herbst, Chicago, subject to be announced.
- Dr. Stanley J. Seeger, Milwaukee, Pediatric Surgical Problems.
- Dr. James M. Mason, Birmingham, will deliver the C. Jeff Miller Memorial Lecture.

"Foundation Prize" in Obstetrics and Gynecology.—Announcement is made of the annual "Foundation Prize" of \$150 to be awarded by the American Association of Obstetricians, Gynecologists and Abdominal Surgeons. Eligible contestants shall include only (a) interns, residents or graduate students in obstetrics, gynecology or abdominal surgery, and (b) physicians (with an M.D. degree) who are actively practicing these specialties. Manuscripts must be presented to the secretary of the association before June 1 under a nom de plume together with a sealed envelop bearing the nom de plume and containing the name and address of the contestant. Manuscripts must be limited to 5,000 words and must be typewritten in double spacing on one side of the sheet. Ample margins should be provided. Illustrations should be limited to such as are required for a clear exposition of the thesis. Three copies of the thesis and the illustrations are to be submitted. The successful thesis will become the property of the association, but this provision does not interfere with publication in the journal of the author's choice. The award will be made at the annual meetings of the association, at which time the successful contestant must appear in person to present his contribution as a part of the regular scientific program, in conformity with the rules of the association and he must meet all expenses incident to the presentation. The secretary is Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 20, 1940.

Medical Students to Return to London

Most of the London medical schools which were evacuated when war began are bringing back as many students as possible. The minister of health has decided that he can no longer pay for the board and lodging of students who have been attached as dressers to the hospitals prepared around London for the reception of casualties which have not materialized as was expected. But later on if the students should be required to assist in the treatment of casualties he may again pay for their board and lodging. The number who return to London depends on how many can be satisfactorily taught with the number of hospital beds now available in London. The London teaching hospitals are still compelled to reserve one third of their beds for possible civilian casualties, and in some the remaining hospitals beds will not be adequate for the clinical teaching of the students. On the other hand, in most cases the education of students billeted at the hospitals in the country suffers. The arrangements for such teaching have been organized for generations at the medical schools of the London hospitals and cannot be reproduced in the country hospitals temporarily organized for the treatment of the casualties of air raids.

The Control of Puerperal Sepsis

The Ministry of Health has issued a memorandum on the control of puerperal fever because the increased knowledge gained during recent years provides a firmer basis for action than has been available heretofore. Yet this knowledge is not being fully applied. It has been shown that the most dangerous puerperal infection—that by hemolytic streptococci—is rarely if ever due to latent infection of the vagina before parturition. It is brought from outside sources at the time of confinement or soon after. The streptococci which give rise to puerperal fever belong to the same group as those responsible for scarlet fever, tonsillitis, adenitis, otitis media and cellulitis. Their chief habitat is the human upper air passages and thence through a variety of agencies—fingers, instruments and possibly air—puerperal infection is derived. The risk of infection with the most dangerous strains can be largely removed by elimination from the environment of all persons with inflammatory conditions of the upper air passages caused by or favoring multiplication of hemolytic streptococci. The application of this knowledge may be considered from two points of view: (1) in the absence of puerperal pyrexia; (2) on the occurrence of puerperal pyrexia.

1. In the absence of puerperal pyrexia, swabbing of the midwife in attendance should not be done, unless she shows signs of an acute or chronic inflammatory condition of the tonsils, pharynx, nose or middle ear. Every midwife should be instructed to report any symptom of such a condition at once, whereupon she should be suspended from duty and swabs should be taken for bacteriologic examination. In the event of obtaining a positive swab there may be some doubt whether the hemolytic streptococci found are responsible for the clinical condition or are merely temporary invaders. The distinction is important, as they are more dangerous when they are responsible; but there is no known bacteriologic method of making this distinction: the number of colonies is no criterion of the presence or absence of an infective process. Therefore every midwife who has reported nasopharyngeal symptoms and has been found to be a carrier of hemolytic streptococci should be suspended. If the streptococci belong to group A she must not resume duty until she has recovered completely and three negative swabs at

daily intervals have been obtained. Pupil midwives should be examined and those who have a chronic infection of the tonsils or sinuses with hemolytic streptococci should be advised that it is likely to prevent them from practicing midwifery.

2. On the occurrence of puerperal pyrexia, steps should be at once taken to ascertain its cause and until genital infection with hemolytic streptococci has been excluded the attendants must not conduct a labor or nurse any other puerperal woman. It has been shown that whenever there is a streptococcal infection of the body of the uterus the organisms will be present in the vagina. If the infection is limited to the vagina or perineum (it very rarely is) nothing is to be gained, but the contrary, by passing a swab into the cervix. Therefore a vaginal swab should be taken in every case of puerperal pyrexia unless the physician can be sure that the fever is not due to infection of the genital tract. This involves examination of a large number of swabs, many of which will not yield hemolytic streptococci. Nevertheless bacteriologic examination of a vaginal swab can rarely be omitted with safety. If it yields hemolytic streptococci, an attempt should be made to ascertain whether any of the attendants are a possible source of infection. Swabs should be taken from the nose and throat and from any cutaneous lesion of the physician or midwife. But, if streptococcal infection of the patient is suspected from the outset, swabs from the attendants should be sent for examination at the same time as the vaginal swab. If any attendants are found to harbor hemolytic streptococci they must cease to attend labors or to nurse other puerperal women until three negative swabs, taken at daily intervals from both the nose and the throat, have been obtained and clinical signs, if any, have disappeared.

PARIS

(From Our Regular Correspondent)

Jan. 13, 1940.

Prophylaxis Against Bubonic Plague

Samoilowitz, during an epidemic in Russia in 1778, observed that those who had been stricken but survived seemed immunized. He sought, like Jenner, to inoculate the pus of buboes containing an attenuated virus. Similar inoculations were safely made in other cases. In 1891 Yersin was able to isolate the bacillus. By repeated punctures he obtained a culture stock which immunized nine tenths of the rats on experimentation. He even inoculated himself, but the epidemic which he had observed in Hong Kong terminated spontaneously. It was Strong in Manila who in 1906 first practiced systematic preventive inoculation. At present the plague is endemic in several countries, notably Madagascar, where from 3,000 to 4,000 cases occur annually.

Yves Gérard in a recent paper described the conditions under which he combated plague in Madagascar. His vaccine was prepared chiefly from an E. V. stock cultured by monthly transplantations since 1926. Thereby an attenuation of the virus was brought about. The injections induced perfect immunization in animals about the tenth day, lasting for nine months. In man the vaccination was performed by the injection of 0.2 cc. of a culture emulsion after a forty-eight hour refrigeration. It induced splenic reactions which indicated immunization. At first, lepers in the advanced stage of the disease and volunteer physicians and male nurses were inoculated, without the least accident, and then the inhabitants of endangered villages. The original doses were increased without any grave incidents. In the district of Emyrne 46,879 natives were thus vaccinated; 60,000 served as controls. In the first group, mortality from plague was 0.47 per thousand and the general mortality 4.8. In the control group mortality was 1.66 per thousand and the general mortality 9.7, twice greater. During the three years 1935-1937, 791,160 inhabitants of the high plateaus were inoculated. Mortality was reduced

from 3,493 in 1933-1934 to 596 in 1937-1938, an 80 per cent reduction. Mortality could probably be reduced still more, he said, by intensifying vaccine concentrations. In Java, where Kolle's bacterial vaccine was used, mortality was reduced only 50 per cent. Apparently the E. V. Madagascar stock is superior to the Tsiwidej Java stock for purposes of inoculation.

Osteopathies Due to Vitamin C Deficiency

According to Policard and Leriche, bone regeneration in fractures begins with a decalcification stage, followed by calcium precipitation essential to calcium formation. These calcium localizations are related perhaps in a causal way to a circulatory activity at the bone level. However, causal relationship cannot be asserted. Microscopic observations, for example, show an extreme tissue congestion at points level with the epiphyses or metaphyses during the decalcified phase, but it cannot be determined whether this congestion is active or passive. On the other hand, in secondary lime precipitations observed in the periphery of the bone, or in the para-osseous mesodermal tissues, the periosteal tissues are the seat of hemorrhagic edemas that indicate circulatory slowing and stagnation apparently favorable to the secondary process of peripheral recalcification.

G. Mouriquand and V. Edel, in the course of investigations made especially by means of x-ray examinations, the results of which they reported to the Academy of Medicine, sought to determine to what extent calcium metabolism was modified under acute, subacute or chronic conditions of vitamin C deficiency. They observed that about the fifteenth day the epiphysal and metaphysal areas first become decalcified and then softened. In acute or subacute cases this reabsorption of calcium was not accompanied with any change, no calcium being carried to the periphery. In chronic states, on the contrary, induced by the addition of 0.5 mg. of ascorbic acid (either synthetic or lemon juice) hypertrophic and often osteophytic calcium deposits were observed about the seventieth day and in all cases before the one hundred and twentieth day, accompanied with ankylosis of the posterior portion.

Mouriquand and Edel think that a certain lapse of time is necessary for the transfer of calcium from the central bone regions to the periphery. Whether the calcium reabsorbed during the time preceding the transfer remains in the bone tissue in a transitional state or is eliminated by the feces or urine, making room for other extra-osseous calcium supplies, raises questions more easily asked than answered, though observed experimentally and radiographically. Since vitamin C deficiency, like vitamin D deficiency, is a factor in decalcification, the regimen in bone fractures must be adjusted to prevent it.

BERLIN

(From Our Regular Correspondent)

Jan. 3, 1940.

Further War Measures

The premature granting of medical appointments because of the dearth of physicians in the absence of the state medical examination does not *ipso facto* confer the degree of doctor of medicine, even if an acceptable dissertation has been submitted. It is ordered that doctoral examinations be postponed until the required medical education has been completed and the required training service has been made up. The salary of these students of medicine, prematurely and exceptionally approved and assigned to sick fund service, is to be placed on a footing fundamentally equal with that of physicians previously appointed. It is therefore permissible to appoint them at once as assistants in hospitals where vacancies exist.

The identification tag that every soldier in the German army must wear around his neck will henceforth indicate the blood group to which he belongs.

In accordance with regulations requiring economy in filling out prescriptions containing fats, alcohols and similar sub-

stances of value for war purposes, fats of all kinds may now be prescribed only under the most stringent need. Soap may be prescribed only in quantities indispensably necessary to promote recovery. The prescription of medicines rich in sugar, such as cough syrups, should be carefully checked. The cultivation of medicinal plants in the vegetable gardens of the hospitals of Berlin has continually been increased. In 1938, 4,440 square meters of land was planted with camomile, 4,015 with peppermint, 1,540 with sage, 7,984 with valerian, 2,300 with primrose, 500 with lilies of the valley. Iodine and its derivatives may be sold in drug stores only on medical prescription.

Vitamin Needs of the Navy

Two navy physicians, Drs. Stutz and Weispfennig, report in *Der deutsche Militärarzt* investigations on the vitamin needs of sailors made at the Baltic Sea marine station. They were unable generally to confirm the observations made by others that 50 mg. of ascorbic acid is insufficient for daily needs under conditions existing on board ship. This amount of vitamin C is sufficient for conditions on land when physical exertion is moderate. The authors found that a combination of vitamin C and B₁ was superior to the sole use of vitamin C. The most favorable results were obtained by the use of lemons. A distinct superiority of natural vitamins over artificial products was noted. Environmental factors, such as sun irradiation, play an important part in vitamin metabolism. They recommend provisionally a combined use of vitamin C and B₁ for men at sea. The utilization of high grade lemon extract is, according to the authors, very limited on board ship. Germany does not import such large quantities of lemons as would be required nor would there be room enough on board ship for the barrels of lemon extract needed. The authors recommend a haw marmelade to be made at 176 F. with oxygen control and to be consumed on bread.

Control of Rickets

The minister of the interior has directed all governmental health bureaus to summon all mothers of infants from 3 to 12 months of age for a medical examination in connection with measures designed to combat rickets. If signs of rickets are noted, the mother receives a bottle of irradiated ergosterol with instructions to add five drops daily to the food. The bottle contains a supply for about two months. The child is then reexamined and additional medicine given. If after a third examination symptoms of rickets are still present, the child is assigned to the supervision of a physician. If the mother is unable to pay for the service, social security provisions and, if necessary, the public welfare program of the national socialist party guarantee the expense. No parents are exempt from the regulations requiring infant examination. These measures represent a new kind of prophylaxis on a large scale, similar to that governing the vaccination of a populace. It is estimated that about 1,500,000 infants will be subject to the first examination. These general tests will enable the government also to determine the actual spread of rickets. Heretofore the local statistics available have been so conflicting that no general conclusions could be drawn from them.

Increased Consumption of Alcohol in Germany

According to the most recent statistics the production of beer, which increased in the fiscal year of 1937-1938 9.3 per cent (3.7 million hectoliters) showed a still greater increase in the fiscal year of 1938-1939, namely 10.3 per cent (4.51 million hectoliters). The total of 48.11 million hectoliters represents an increase of about 43 per cent over the low totals for 1932-1933. Simultaneously the consumption of alcohol increased to a still greater degree. In the first quarter of the year 1939-1940 there was noted a still further enhancement of beer consumption in Germany.

BELGIUM

(From Our Regular Correspondent)

Jan. 4, 1940.

Use of the Radioscope in the Army

Toussaint discussed the systematic use of radioscopy of the lung in freshly mobilized recruits before the Belgian society of radiologists. Since roentgenography could not be considered for economic reasons, radioscopy might prove immensely serviceable in detecting pulmonary tuberculosis, at present amounting to 1 per cent of the fighting forces. Otherwise lesions would tend to spread and increase under the strain of exercise and fatigue and increase the drain on the national treasury. The systematic use of the radioscope required: 1. Medical personnel consisting of four radioscopists chosen after their eyesight had been tested. They would not be radiologists but internists specially trained for examinations of this kind. 2. Proper equipment consisting of a movable x-ray apparatus, suitably protected. In order to avoid delays, adequately lighted gangways would facilitate the passing of the men behind the screen. 3. A smoothly functioning organization that did not interfere with military activities. Under the conditions mentioned, about 100 men could be examined in one hour.

Diphtheria Control in the Schools

Perkowsky, speaking before the Belgian association of social medicine, pointed out that diphtheria cases were still numerous. The speaker discussed the procedures in use to prevent diphtheria, such as the closing of schools, inoculation, detection of germ carriers and isolation of those infected. These measures, he said, have proved insufficient. The detection of germ carriers took too much time and in epidemics the results of the examination of specimens ran the risk of being too late to permit an effective prophylaxis. While declaring himself in favor of inoculations thoroughly and extensively performed, Perkowsky proposed regular daily examinations in school centers in time of epidemics. These examinations, conducted by school physicians, required no complex organization and permitted serum injections at once, on the least suspicion. Serum injections, promptly administered and in sufficient quantities, he said, were efficacious in all cases.

Hospitalization of Indigent Tuberculous Patients

In the report of the minister of public health, figures are given indicating the ravages of tuberculosis since the World War. The increase before and after the war can be noted from the following comparison: If 100 is taken to represent the number of deaths per hundred thousand in 1913, the mortality in 1918 for the different countries was 109 for France, 144 for England, 164 for the Netherlands, 154 for Germany and 208 for Belgium. Although good reasons exist for believing that Belgium will not again suffer a debilitation period like that of 1914-1918, the public health department is considering a plan that aims at the isolation of tuberculous patients in sanatoriums. At present these institutions receive three kinds of patients: those who pay for their services, social insurance beneficiaries and the indigent. Numerous communes, however, do not have the resources to care for indigent patients in a sanatorium. The health department plans to meet the needs of the third class. Provincial communal funds have been created entrusted with the hospitalization of tuberculous and carcinomatous persons. To extend their activities, that is to double the number of those hospitalized, it is estimated that 16,000,000 francs will be needed annually.

Diseases of Workers in Cotton Factories

Before the Belgian association of social medicine, Thiry set forth the results of an inquiry begun last year in which about 310 workers in cotton mills were examined. His attention in this inquiry was directed: 1. To the considerable incidence,

at every age level, of enlarged lymph glands, chiefly in the neck and axillae. 2. To the extremely numerous cases in young persons of abnormal modification of the blood pressure. Hypotension was exceptional, hypertension common and at times high. In certain cases hypertension could be attributed to pulmonary sclerosis, which affects numerous cotton mill workers. However, hypertension could not thus be accounted for in youthful workers presenting no pulmonary lesions that might affect the circulation. 3. To modification in the sedimentation rate.

International Union Against Venereal Diseases

The "Union internationale contre le péril vénérien," founded by Professor Bayet in 1922, held its annual meeting in Liège, June 24-28, 1939. The following resolutions and recommendations were passed and copies sent to all governments which have representatives in the union: 1. Antivenereal dispensaries should make available to their patients the new resources of antigonococcus chemotherapy in conjunction with the gynecologic services rendered to women affected with gonorrhea. 2. Sulfanilamides intended for the internal chemotherapeutic treatment of gonorrhea should be delivered only on a nonrenewable medical prescription. The union went on record requesting that the governments make arrangements with the military authorities that no special measures, such as penalties and prolongations of the time of service, be resorted to when soldiers were known to have venereal disease, since such measures resulted in withdrawing a great number of infected from medical examinations and treatments.

Trends in Cardiology

According to Dautrebande, who discussed the present tendencies and evolution of cardiology before the Belgian cardiologists (Journées Belges de Cardiologie), cardiology is more and more taking its orientation from physiology. Too much importance, attached for a long time to clinical symptoms, kept the cardiologists from studying the problems of cardiac function. At the source of this function is found the cardiac output. This permits early diagnosis of heart failure long before clinical studies have been made. However, of greater interest to cardiologists than the heart is the periphery of the heart. The speaker pointed out the significance of tests that estimate the strength of oxygen administration. The problem consisted here in maintaining the tissues and especially the myocardium under conditions of normal oxygenation. He demonstrated the value of oxygen for the circulation by showing its effects in hypertension produced by renal ischemia.

Marriages

JOHN STAIGE DAVIS JR., New York, to Miss Florence Roome at East Williston, N. Y., Dec. 9, 1939.

LAMBERTUS E. BEEUWES to Miss Hilda G. Smith, both of Dearborn, Mich., in December 1939.

IVAN WILLARD BROWN JR., Newfane, N. Y., to Miss Madeline Davis at New York, Dec. 28, 1939.

JOHN S. BEASLEY, Centerville, Tenn., to Miss Allie Brown Regeon at Franklin, Dec. 14, 1939.

BURNETT B. FORMAN, Indianapolis, to Miss Margaret Nelson, of Union, Wash., Sept. 14, 1939.

JEFF N. WEBB, Seneca, S. C., to Miss Willie Sue Boleman, of Townville, Dec. 29, 1939.

ANDREW MUNTAN, Detroit, to Miss Mary Chargo at Bowling Green, Ky., February 1.

CLARENCE B. SACHER to Miss Rose Mary Hargrave, both of Dallas, Texas, Dec. 1, 1939.

ELWYN S. SHONYO, Elgin, Ill., to Miss La Von Abraham, of Chicago, January 13.

GEORGE RENNER JR., Cincinnati, to Miss Naomi Butler in January.

Deaths

Harry Milton Weed @ Buffalo; University of Buffalo School of Medicine, 1903; professor of ophthalmology emeritus at his alma mater; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; ophthalmologist to the Buffalo General, Millard Fillmore, Children's, St. Mary's Maternity, Erie County, and Buffalo City hospitals, Buffalo, and Moses Taylor Hospital, Lackawanna; served during the World War; aged 65; died, Dec. 5, 1939, of coronary occlusion.

John Grant Quimby, Lakeport, N. H.; Medical School of Maine, Portland, 1888; at various times member of the house of representatives and state senate; for many years member of the board of education and chairman of the board of health; chairman of the board of trustees of the Laconia (N. H.) State School; aged 77; died, Dec. 12, 1939, of cerebral hemorrhage.

Frederick Henry Thompson, Fitchburg, Mass.; Harvard Medical School, Boston, 1870; member of the Massachusetts Medical Society; member of the House of Delegates of the American Medical Association in 1911-1912; for many years on the staff of the Burbank Hospital; aged 95; died, Dec. 14, 1939, of arteriosclerosis.

William McIlwain, Detroit; University Medical College of Kansas City, Mo., 1898; in 1929 was awarded the Distinguished Service Cross by the War Department for gallantry in action while serving with the "Lost Battalion" during the World War in France; aged 81; died, Nov. 28, 1939, of cerebral arteriosclerosis.

Oscar Emanuel Grant @ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; fellow of the American College of Surgeons; on the staff of the Swedish Covenant Hospital; aged 60; died, January 4, at Fairhope, Ala., of heart disease.

Thomas A. Moore, Plainview, Texas; Memphis (Tenn.) Hospital Medical College, 1900; at one time health officer of Briscoe County; formerly on the staff of the Wichita Falls (Texas) State Hospital; aged 64; died, Dec. 29, 1939, of chronic myocarditis.

Ortus Fuller Adams, Trinidad, Colo.; Northwestern University Medical School, Chicago, 1901; veteran of the Spanish-American and World wars; formerly county coroner; aged 62; died, January 3, in Mount San Rafael Hospital of hypertension and uremia.

Burton J. Simpson, Chicago; Rush Medical College, Chicago, 1900; member of the Illinois State Medical Society; on the staff of the Englewood Hospital; aged 69; died, January 8, of Parkinson's disease, cerebral arteriosclerosis and pneumonia.

Stewart Slocum @ Fortville, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1900; past president of the Hancock County Medical Society; aged 71; died, Dec. 18, 1939, at Van Nuys, Calif., of injuries received in an automobile accident.

Pierce A. Meck, Nanticoke, Pa.; Jefferson Medical College of Philadelphia, 1884; member of the Medical Society of the State of Pennsylvania; formerly president of the board of health and health officer; aged 80; died, Dec. 4, 1939, of senility.

George Augustus Cherry @ Flushing, N. Y.; University of the City of New York Medical Department, 1891; formerly on the staffs of the New York Foundling and Bellevue hospitals, New York; aged 69; died, January 17, of heart disease.

Frank Albert Foster, Los Angeles; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; at one time coroner and health officer in Charlevoix County, Mich.; aged 81; died, Dec. 23, 1939, of coronary thrombosis.

Peter F. Sheaffer, Christiana, Pa.; Jefferson Medical College of Philadelphia, 1881; member of the Medical Society of the State of Pennsylvania; aged 80; died, Nov. 29, 1939, in the Lancaster (Pa.) General Hospital of uremia.

Herbert William Plummer, Lime Spring, Iowa; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905; member of the Iowa State Medical Society; aged 62; died, Dec. 5, 1939, of sarcoma of the lungs.

Frank Reynolds Fleming, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1911; on the staff of the Belmont Hospital; aged 52; died, Dec. 12, 1939, of cerebral hemorrhage and arteriosclerosis.

George Alanson Crittendon, Springfield, Mass.; Dartmouth Medical School, Hanover, N. H., 1908; aged 59; died, Dec. 5, 1939, in the Springfield Hospital of cerebral hemorrhage, arteriosclerosis and chronic nephritis.

Norman Irving Broadwater @ Oakland, Md.; University of Maryland School of Medicine, Baltimore, 1909; bank president; aged 57; died, January 3, in the Memorial Hospital at Cumberland of cerebral hemorrhage.

David Merring Milholland, Defiance, Ohio; Miami Medical College, Cincinnati, 1884; member of the Ohio State Medical Association; aged 81; died, Dec. 26, 1939, in a hospital at Toledo of arteriosclerosis.

James McIntire Fleming, Blairs Mills, Pa.; Medico-Chirurgical College of Philadelphia, 1896; aged 70; died, Nov. 8, 1939, in the Lewistown (Pa.) Hospital of cirrhosis of the liver and arteriosclerosis.

Francis B. Warnock, Sioux City, Iowa; State University of Iowa College of Medicine, Iowa City, 1882; member of the Iowa State Medical Society; aged 80; died, Dec. 28, 1939, of coronary thrombosis.

Raymond Evan Bailey, Hamlin, W. Va.; Medical College of Virginia, Richmond, 1927; member of the West Virginia State Medical Association; aged 37; died, January 7, in a hospital at Huntington.

Argolis O. Varner, Union Star, Mo.; Missouri Medical College, St. Louis, 1882; for many years bank president; aged 87; died in December 1939 in St. Joseph of cerebral hemorrhage and arteriosclerosis.

James Nathan Rohrbach, Palm, Pa.; Jefferson Medical College of Philadelphia, 1904; aged 68; died, Dec. 19, 1939, in the Sacred Heart Hospital, Allentown, of pneumonia and paralysis agitans.

William Cowley, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1886; aged 75; died, Dec. 20, 1939, in Sherman, Conn., of chronic myocarditis, hypertension and thrombosis.

William Franklin Strangways, Little Rock, Ark.; M.B., Trinity Medical College, Toronto, Ont., Canada, in 1876 and M.D. in 1878; aged 83; died, Dec. 30, 1939, of carcinoma of the prostate.

C. Colfax Smith, Clarksville, Iowa; Northwestern University Medical School, Chicago, 1904; member of the Iowa State Medical Society; aged 71; died, Dec. 5, 1939, of coronary sclerosis.

Luella Z. Rummel, Kansas City, Mo.; Hering Medical College, Chicago, 1901; Eclectic Medical University, Kansas City, Mo., 1917; aged 75; died, Dec. 27, 1939, of mitral stenosis.

Willoughby H. Reed, Jeffersonville, Pa.; Jefferson Medical College of Philadelphia, 1882; formerly a druggist; aged 83; died, Dec. 19, 1939, in Deland, Fla., of heart disease.

Fred Lee Johnson, Detroit; Cleveland Homeopathic Medical College, 1903; served during the World War; aged 61; died, January 7, of a self-inflicted bullet wound.

Thomas Jefferson Williams, Bogalusa, La. (licensed in Louisiana in 1925); aged 67; died, Dec. 17, 1939, in New Orleans of acute dilatation of the heart.

Maurice Freiman, New York; University and Bellevue Hospital Medical College, New York, 1908; aged 55; died, Dec. 22, 1939, of cerebral hemorrhage.

Harold Attig Miller, San Francisco; Jefferson Medical College of Philadelphia, 1914; aged 49; died, Nov. 11, 1939, of coronary thrombosis and myocarditis.

Hilmar Munster, Belmont, Calif.; University of Rochester (N.Y.) School of Medicine, 1929; aged 35; was found dead, Dec. 21, 1939, in a hotel at Berkeley.

Luther W. Bowman, McAllen, Texas; State University of Iowa College of Medicine, Iowa City, 1886; aged 80; died, Dec. 29, 1939, of myelogenous leukemia.

Weden M. Tibbitts, Topeka, Kan. (licensed in Kansas in 1901); aged 75; died, Dec. 30, 1939, of hypertension, chronic myocarditis and diabetes mellitus.

Richard S. Starkey, Seattle; Jefferson Medical College of Philadelphia, 1895; aged 73; died in December 1939 of heart disease and gallbladder infection.

John Patterson Hartwell, Elmira, N. Y.; Long Island College Hospital, Brooklyn, 1886; aged 78; died, Dec. 3, 1939, of cerebral hemorrhage.

H. Dudley Young, Los Angeles; Harvard Medical School, Boston, 1895; aged 72; died, Nov. 22, 1939, of prostatism.

Correspondence

PELLAGRA

To the Editor:—I read with keen interest your recent article on pellagra and note that you have given a lot of credit to Goldberger. Have you read the paper by George H. Searcy on "An Epidemic of Acute Pellagra" (*Tr. M. A. State of Alabama*, 1907, p. 387)? His paper is quite enlightening because of its priority. He discussed the symptoms, diagnosis, pathology, prognosis and treatment. He made the statement that "the essential management consists in placing the patient in good hygienic surroundings and trying to improve the general health by good nourishing food and such tonics as may seem indicated" (p. 390). In the discussion that follows the paper Dr. Searcy states that "it might be well for the profession to look out for these diseases, especially among Negroes, who often times have nothing more to eat than corn bread and a little meat." His remarks concerning the nurses' diets and those of the patients are interesting and might have given Goldberger an idea as to his research.

Dr. Searcy died a few years ago; I am writing because of my own interest in seeing that priority is given to his work.

EMMETT B. CARMICHAEL, PH.D., University, Ala.

"BURN SHOCK"

To the Editor:—In their article "Burn Shock," published in the Dec. 16, 1939, issue of *THE JOURNAL*, Trusler, Egbert and Williams state that they frequently observed low blood sugar values in dogs in which various degrees of burns had been produced experimentally. They further state that they are unable to explain these low values but feel that this point should be considered in the treatment of burn shock.

In an article entitled "Pathogenesis of Death from Burns" (Greenwald, H. M., and Eliasberg, Helene: *Am. J. M. Sc.* 171:682 [May] 1926) we reported two cases in which children aged 2 and 3 years respectively died of burns. One child was observed to have an entire absence of sugar in the blood and the other child had 30 mg. per hundred cubic centimeters. This was striking in view of the fact that Underhill had just described a series of cases in which an increased concentration of sugar in the blood had been found.

Our observations led us to believe that perhaps there were other factors than just the physicochemical changes of shock responsible for the changes in the blood sugar content. We therefore studied, experimentally, blood sugar levels in burns and the effect of burns on the organs most concerned in the regulation of blood sugar levels, using the rabbit as the experimental animal. We observed that a marked rise in blood sugar values occurred uniformly in all the rabbits within a few hours after the burn; the greatest rise occurred in the rabbits that were most severely burned and that presented the greatest degree of shock. In seven rabbits a marked drop followed the initial rise.

All except one rabbit showed a marked decrease in either muscle or liver glycogen or both. Microscopic examination of the pancreases showed normal glandular structure; the liver, aside from the absence of or a decrease in glycogen, showed no striking changes. The adrenals, however, showed definite changes. In the animals that died within three or four hours after the burn increased cellular activity was found; in those that lived for from twenty-four to forty-eight hours definite degenerative changes were found but were associated practically always with evidence of regeneration.

Since in the initial stage of a severe burn marked hyperactivity of the adrenals was found, we concluded that this was responsible to a great degree for the high blood sugar values noted. The glycogen content of the livers as well as of the

muscles was markedly decreased in these rabbits. These facts tended to bear out the assumption that an outpouring of epinephrine into the circulation occurred as a result of the increased secretory function of the adrenal glands. In the later stage the destructive changes in the adrenals were responsible for a decreased amount of epinephrine thrown into the blood stream and thus inhibited the liver in its normal glycogenolytic function, with resulting hypoglycemia.

If one can apply conclusions drawn from experimental burns in animals to burns in man, it can be stated that in the first stage of a severe burn the high blood sugar level observed is due not to blood concentration alone but also to increased adrenal secretion and that the low blood sugar observed at a later stage is in part due to failure of the adrenals.

H. M. GREENWALD, M.D., Brooklyn.

SENSITIVITY TO SOLUTION OF POSTERIOR PITUITARY

To the Editor:—Occasionally during the past few months I have seen communications in *THE JOURNAL* referring to hypersensitivity to solution of posterior pituitary. This reminds me that in November 1931 I had a case of allergic reaction from the injection of solution of posterior pituitary following the third stage of labor. Apparently the patient almost died and was saved only by the prompt administration of epinephrine.

I reported this case to the manufacturer (Parke, Davis & Co.) and was advised by the chief of the research department (Dr. Kamm) that this was the first instance of which he had ever heard of allergic reaction from solution of posterior pituitary. Later, with the assistance of the American Medical Association library and Dr. Kamm, I reviewed the literature and found four or five cases reported from abroad. I then prepared a brief paper on the subject of hypersensitivity to solution of posterior pituitary and submitted it to *THE JOURNAL* for publication. It was returned with a notation that, while it was an unusual report, it did not seem to be an occurrence of sufficient interest to warrant publication. It is a source of some satisfaction to me to learn that my observation in 1931 of hypersensitivity to this preparation is now being confirmed by other observers.

J. STREET BREWER, M.D., Roseboro, N. C.

LIPOID PNEUMONIA

To the Editor:—The editorial "Lipoid Pneumonia" (*THE JOURNAL*, January 20) is timely and forceful, but it falls far short of its potential value by reason of two serious omissions.

Reference to Drs. P. R. Cannon and T. E. Walsh should recall at once "The Problem of Intranasal Medication," published in the *Annals of Otolaryngology and Rhinology* in September 1938. In this report was proof that the so-called mild silver proteins argyrol and neosilvol provoke pulmonary tissue reaction with consequent damage to lung tissue similar to that produced by liquid petrolatum. These products are still in common, although diminishing, use by the profession and public alike.

Also, having pointed to the wrong road, had you indicated the right one you would have added utility to enlightenment. Thus, the same investigators demonstrated that isotonic saline solutions of ephedrine and related vasoconstrictors caused no reaction in pulmonary tissue. This coincides with previous studies on their relation to nasal and sinusal epithelium. The investigators, therefore, advocate these solutions as the medications of choice for local nasal treatment.

The modern trend is toward a physiologic approach to rhinologic problems. This is a sound but revolutionary change in a specialty that has lagged behind all others in clinging to empiricism. The evidence produced by Laughlen, and more recently

by Walsh and Cannon, shows clearly the dangers of empiricism. For a generation nostrums of little use and much harm have been prescribed and widely used. Not only has the practice been unscientific and harmful, it has evidenced a notable lack of curiosity in a speciality in which ingenuity has been notably abundant.

My feeling is that failure to make correction will not be missed by the manufacturers of the "mild silver" nostrums whose advertising is always with us.

S. N. PARKINSON, M.D., Oakland, Calif.

GERIATRICS AND DIET

To the Editor:—In the article by Dr. E. I. Tuohy in THE JOURNAL January 20 entitled "Geriatrics in Relation to an Adequate Energy Producing and Protective Diet," there are two points that call for comment. These two corrections, one major and one minor, in no way detract from the general excellence of the article, which stresses matters in the diet of older persons for which the physician may unwittingly have been at fault, limiting more and more of the diet until there is less and less of the patient to eat it.

In referring to the word geriatrics, Dr. Tuohy says that "Masters introduced it in a thesis in 1914. . . ." Dr. I. L. Nascher was the author of a large textbook, "Geriatrics," published in 1914, at which time the name came into some general usage. However, in a letter received from Dr. Nascher in July 1938 there is the following (with the permission of Dr. F. R. Packard): "The name was not coined in 1914 but in a paper published in the *New York State Medical Journal*, Aug. 21, 1909. I gave a talk on geriatrics before the New York County Medical Society in 1910 and 1911; lectured on geriatrics at Bennett Medical College, Chicago, now Loyola University School of Medicine, in 1911 and 1912, and at Fordham Medical College, 1913-1914." For the sake of accuracy and to settle the point of priority, this excerpt of Dr. Nascher's letter should be sufficient.

The second point has to do with a quotation from my paper entitled "History of Geriatrics (*Ann. M. Hist.* 10:324 [July] 1938). The point is minor, but because the meaning has been changed slightly I should like to correct it. Speaking of the attitude toward older persons in the early stages of civilization, the correct quotation is "Religion gave them an aura, wisdom gave them a shield, and respect for accumulated surpluses extended their influence over possible heirs."

JOSEPH T. FREEMAN, M.D., Philadelphia.

LIVER DAMAGE FROM ARSENICAL REMEDIES

To the Editor:—In THE JOURNAL Dec. 30, 1939, page 2422, appears an editorial entitled "Public Interest in Venereal Disease," which states that "the number of doses of the arsenical drugs used for the treatment of syphilis amounted in the last fiscal year to 10,656,253, an increase of 84 per cent over the number of doses of such drugs used in 1933."

A cursory examination of these data along with the rules recommended by the U. S. Public Health Service reveals that they are highly commendable, but there is nevertheless a very definite warning which should be incorporated in this advice. At present our knowledge of liver function is adequate to establish the fact that one cannot use arsenic indiscriminately in all cases without occasionally producing liver damage which might subsequently cause serious consequences. In spite of the limited value of the various methods for testing liver function, liver damage due to arsenic can often be detected before clinical signs are apparent and the plan of therapy altered accordingly.

EDWIN J. GRACE, M.D., Brooklyn.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EARLY TABES: MARRIAGE, TREATMENT, PROGNOSIS

To the Editor:—A white man aged 33 acquired syphilis some nineteen years ago in Egypt. He was intensively treated with arsenicals and with preparations of bismuth and mercury for a period of eleven years. No definite data are available as to the number of treatments or the dosage the patient received. Following a rest period of about sixteen months he was again treated for a period of four years, this time in England. For the next two years he received no treatment. He never had the spinal fluid examined, while the Wassermann reaction always remained four plus. Within the past year and a half he has received fourteen injections of nearsphenamine 0.6 Gm., sixty injections (six courses) of bismuth salicylate 1 cc., ten injections of silver arsenamine 0.3 Gm. and ten injections of trypanamide 0.3 Gm. The blood Wassermann reaction at the beginning of the treatment was four plus and at the end of it three plus. The first spinal fluid examination showed the Wassermann reaction 2 plus, the Kahn reaction 2 plus, a mild syphilitic colloidal gold curve (122321000), the first globulin 3 plus (moderate trace), cell count 20 cells per cubic centimeter. At the end of the last series of treatments the spinal fluid Wassermann reaction was 1 plus, the Kahn reaction 2 plus, a weak syphilitic colloidal gold curve (1123221000), this result being negative from another laboratory, globulin 3 plus and the cell count 8 cells per cubic centimeter. The patient's general physical examination is essentially negative except for absent knee jerks. There are no cardiovascular signs or symptoms and no abnormal mental signs. The right pupil is smaller than the left, but both react to light and in accommodation. The Romberg sign is negative. The problem this patient presents concerns my advice to him about marriage as well as his mismanaged treatment in the past and the proper treatment in the future. Both the patient and his fiancée are aware of the nature of his condition as well as the probable hazard of economic liability. The questions which must be answered are: 1. Is marriage advisable? 2. What are the chances of his wife being infected? 3. What are the possibilities of their children having congenital syphilis? 4. What would the ordinary progress of his disease be under supervision and treatment and without it? 5. Could he carry on a normal life should his disease appear checked? Is life expectancy shortened? 6. What should his future treatment consist of, how long, and what is the prognosis?

M.D., New York.

ANSWER.—Before replying to the specific questions it is necessary to discuss the diagnosis and treatment of the case in question. While the data given as to neurologic examination are inadequate, nevertheless the inequality of the pupils and the absence of the knee jerks suggest that the patient has early tabes dorsalis. This suggestion is strengthened by the fact that the spinal fluid is abnormal. However, it is quite impossible to interpret the two spinal fluid examinations. The statement given that the Wassermann and Kahn tests on the spinal fluid are 1+ or 2+ has no significance in permitting any determination of the degree of spinal fluid abnormality or in correlation of serologic with clinical observations. The only permissible conclusion is that the patient's spinal fluid contains some reagin. Spinal fluid examination is hopelessly incomplete unless it includes a quantitatively titrated complement fixation test (Wassermann test), using varying amounts of fluid ranging from 0.1 cc. to a maximum of 1 cc. If the complement fixation test is positive with the smallest amount of fluid named, 0.1 cc., the quantitative titration should be carried even lower, as for example, 0.05 cc., 0.025 cc., and so on. It is perhaps not absolutely necessary to have these data in order to plan intelligently for the immediate future, but the spinal fluid examination should be carried out in the manner indicated in the future, in order to determine progress and the desirability of termination of treatment.

As to past treatment, it can be said that sixteen and a half years of continuous chemotherapy is ridiculous for any type of syphilitic infection and is clearly indicative that the treatment given, while perhaps more than satisfactory in amount, has been less than satisfactory in type. It is taken for granted that when the inquirer mentions a dose of trypanamide as 0.3 Gm. he actually means 3 Gm., since the former dose is homeopathic.

Nothing can be said as to the results of the treatment so far given from the serologic point of view. A change in the blood Wassermann reaction from 4+ to 3+ is of no significance. The change in the blood test, like that in the spinal fluid, cannot be estimated unless the test is quantitatively titrated.

To proceed now to the specific questions:

1. There is no medical reason to object to this patient's marriage provided his fiancée is aware of the nature of the condition and the probable hazards of economic disability, as the inquirer states that she is.
2. The chance of the patient's wife becoming infected is infinitesimally small and can be almost completely ignored. For

all practical purposes, syphilis is not infectious to the wife after the infection in the marital partner has existed for five years or longer.

3. There is no possibility that any children will have congenital syphilis unless the wife is infected. Congenital syphilis is never transmitted by the father alone and occurs only after the father infects the mother.

4. It is quite impossible to offer any estimate as to the progress of this patient's disease without further treatment. There is some chance that he might go happily through life without the development of any further symptoms or physical signs, even though additional treatment is not given. However, since he has already shown definite evidence of organic damage of the nervous system and since spinal fluid abnormalities still persist, it might be guessed that there is approximately a 50 per cent chance or greater of further progress if additional treatment is not given. If, on the other hand, the patient is properly treated from this point on there is approximately a 95 per cent certainty of complete arrest of the process at its present level.

5. He can carry on a normal life should his disease appear checked. Life expectancy is probably not shortened.

6. Since sixteen and a half years of chemotherapy has been unsuccessful in preventing the development of neurologic abnormalities clinically and in the spinal fluid, it may be taken for granted that further treatment of this sort is likely to be without avail. The patient should be immediately treated with non-specific fever therapy, preferably with malaria, during the course of which he should be allowed to have from ten to twelve paroxysms, in each of which temperatures of 104 F. or over should be attained. Following the completion of the malaria treatment he should undergo six months of further chemotherapy with tryparsamide, twenty-six consecutive injections of 3 Gm. each, the first and last eight of which are combined with simultaneous intramuscular injections of bismuth subsalicylate suspension in oil, each 0.2 Gm. At the completion of this amount of treatment, and regardless of the serologic status, treatment may be at least temporarily discontinued. Following the completion of treatment the patient should be kept under observation indefinitely. For the first three years the blood and spinal fluid should be retested every six months, the blood test being carried out by a quantitative technic, the spinal fluid examination also including a complement fixation test by the quantitative technic described. At yearly intervals the patient should undergo a complete physical examination, with particular emphasis on the cardiovascular and central nervous systems. After three years of this sort of probation the periodic examinations of blood and spinal fluid and physical examinations may be done at yearly intervals instead of six months. They should be continued, however, at intervals of a year for an indefinite period, certainly from five to eight years, and thereafter at least as often as every two years. Treatment need not be resumed unless there is evidence of clinical progress or serologic relapse on a quantitative basis. It is entirely probable that the blood test will remain positive indefinitely and somewhat less likely, though quite possible, that abnormalities may persist in the spinal fluid Wassermann test. The cell count, protein and colloidal tests are likely to become negative. The persistence of these serologic abnormalities, unless they grow distinctly worse on the quantitative basis, however, is not an indication for the resumption or continuation of treatment.

CIRCUMCISION IN WOMEN

To the Editor:—Every once in a while I hear an outburst from an osteopath in this neighborhood on circumcision in women. Kindly give me any information as to the ethics and value of this sort of procedure, if any.

M. F. Smith, M.D., Raton, New Mexico.

ANSWER.—Circumcision in women is not often required, except for hygiene: accumulated smegma beneath an adherent prepuce sometimes is the cause of persistent annoying inflammation. There appears to be little foundation for the belief that an adherent clitoris is often responsible for frigidity: circumcision seldom increases libido. In this connection it may be pertinent to emphasize that the distance from the urethral meatus to the clitoris, accepted to be 2 cm. in the average case, is sometimes 3 cm. or more, and tends, particularly, to approach the latter figure in women who are frigid. The question arises as to whether the increased distance of the clitoris from the vaginal canal may account for some cases of unsatisfactory reaction at intercourse.

In those infrequent cases in which an adherent prepuce causes annoyance, freeing of the prepuce from the clitoris accompanied by a simple dorsal slit ordinarily accomplishes all that can be achieved with a more elaborate circumcision. Circumcision of women certainly cannot be recommended except in rare instances.

LATENT SYPHILIS

To the Editor:—I have had under constant treatment a man aged 40, an American, since Oct. 4, 1938. When first seen he had extensive ulcers of the right lower leg of four months' duration which had failed to heal and had been diagnosed as varicose ulcers. The patient's Wassermann, Eagle and Kline reactions were all four plus. He has been faithful in his treatment, having received forty injections of mapharsen 0.06 Gm., and has also received 2 cc. of bismuth salicylate in oil, forty injections. The ulcers on his leg healed promptly and have remained healed. He is clinically free from symptoms but continues to show a four plus Wassermann reaction. The spinal fluid Nov. 4, 1938, showed a negative Eagle reaction. Wassermann and Kline tests were not made. The colloidal gold curve was 0000110000 and a second spinal puncture was made October 21 which showed the Wassermann reaction negative, Hinton reaction negative and Pandy test for globulin negative but colloidal gold 2222110000. (The patient has also received a large amount of iodide.) What further treatment, if any, should he receive? What should he be told as regards further treatment and the presence or absence of central nervous system syphilis?

M.D., California.

ANSWER.—Apparently this patient falls in the group of so-called "Wassermann fastness," which is a poor term for a persistently positive Wassermann reaction in an individual who has become asymptomatic. The two negative spinal fluid tests eliminate the possibility of neurosyphilis as a background for the persistently positive Wassermann reaction, and if careful examination of the cardiovascular system is negative for aortitis it then seems justifiable to classify the case as one of latent syphilis with a persistently positive Wassermann reaction.

The treatment to date has been good and it seems advisable from now on to limit it solely to the use of bismuth compounds, preferably two courses with twelve injections to the course each year for the next two years. After that it seems advisable to place the patient on parole and have him return for physical examination each year.

Although a history of acute syphilis is lacking in the inquiry, it is probable that the patient has had his syphilis for ten or more years. If this is true, further treatment than the two years of bismuth compounds is not necessary. If in addition to the two negative spinal fluid examinations he shows no clinical signs of neurosyphilis, the patient may be told he does not have central nervous system syphilis.

POSTTRAUMATIC PSYCHOSES

To the Editor:—I would appreciate some information as to present opinions concerning the acute psychotic episodes which sometimes occur as post-operative or posttraumatic complications: 1. In what proportion of these cases is alcoholism a factor? 2. In known alcoholic addicts who come in for acute surgical procedures, is it advisable to give them alcohol in the postoperative period as a preventive measure? 3. Is alcohol advisable therapeutically? 4. Is there any value in insulin provided the patient is not diabetic? 5. What drugs are most satisfactory for quieting the patient and in what doses? 6. What is the general duration of this complication? 7. What is the approximate mortality? 8. Please outline the procedure to adopt in treating a case.

Henry S. Huber, M.D., New York.

ANSWER.—1. Alcoholism has a definite influence on the development of acute psychotic episodes following operations and trauma.

2. The sudden deprivation of alcohol after operation must be avoided.

3. Alcohol has no other therapeutic value.

4. Insulin has no value unless the patient is diabetic.

5. Morphine one-fourth grain (0.016 Gm.) or its derivatives probably serves best in control, but their administration should be used only in nonaddicts.

6. It lasts usually a few days but maybe longer.

7. There is no mortality from the psychotic episodes alone.

8. Fluids and sedatives should be used.

ABSORPTION OF AIR BY TISSUES

To the Editor:—I should like to inquire how long air will remain in a wound before being absorbed: first in a lacerated wound which is left open, second in a cutaneous wound which penetrates fascial planes but without laceration of deeper tissues, in which the cutaneous wound is closed.

M.D., Ohio.

ANSWER.—The time during which air will remain within the tissues depends almost entirely on the quantity introduced. The best evidence has been obtained in cases of tuberculosis in which measured quantities of air have been introduced into the pleural cavity in the production of artificial pneumothorax. It is estimated that 500 cc. of air introduced into a normal pleural cavity is absorbed within two weeks. The amount of air that might ordinarily be introduced into a penetrating or lacerated wound would be entirely absorbed in a few hours.

RECURRENCE OF PLACENTA PRAEVIA

To the Editor:—A patient had a normal pregnancy and delivery in 1933 and placenta praevia in 1934 and again in 1936. She desires more children but hesitates because of past experiences. What are her prospects? Is there a predisposition to placenta praevia in certain individuals and, if so, can anything be done about it?

M. A. Kline, M.D., Dalton, Pa.

ANSWER.—Placenta praevia is not likely to recur in subsequent pregnancies. In a careful study of some 300 patients with placenta praevia, the condition recurred in only two individuals. This incidence is no greater than the incidence in pregnancy. It is therefore unlikely that the patient referred to would have a repetition of her experiences. She can be encouraged to become pregnant again.

STREPTOCOCCI IN THROAT OF CHILDREN'S NURSE

To the Editor:—In the opinion of public health authorities does the routine finding of Streptococcus viridans or Streptococcus haemolyticus in the throat of a healthy girl make it dangerous or inadvisable to employ her as a nurse for young children? I have advised the mother of the children that the organisms are frequently found on routine examination and are of no significance.

Edward F. Briggs, M.D., Mount Kisco, N. Y.

ANSWER.—Streptococcus viridans is found in all adult throats and is of no significance. Hemolytic streptococci in the throat of a nurse would be objectionable and a source of danger to children.

EARACHE AND MENSTRUATION

To the Editor:—In further comment on "Earache and Menstruation," which appeared in Queries and Minor Notes in The Journal, May 27, 1939, page 2196, I should like to mention the following additional references: Kuttner writes in his book "Die nasalen Reflexneurosen" (nasal reflex neuroses) (1904): Haug reports four women with sensations of pain and subjective sounds in the ears, which either appeared or were intensified during the menstrual period. By cocaineization or by cauterization of the nasal mucosa the pains could be overcome. The paper by Haug is titled Ueber die Beeinflussung gewisser subjektiver Ohrenscheinungen durch Behandlung der genitalen Sphäre der Nase (modification of certain subjective ear symptoms by treatment of the genital sphere of the nose) Monatsschrift für Ohrenheilkunde, 1903, p. 96.

Isaac Bamberger, M.D., Jerusalem, Palestine.

FLUOROSCOPY IN MINIMAL TUBERCULOSIS

To the Editor:—In Queries and Minor Notes in The Journal, there appears an answer to the question "Will you kindly inform me as to the reliability of fluoroscopic examination in detecting cases of minimal tuberculosis?" It seems to me that this question was completely decided many years ago and decided in the negative. Fluoroscopic examination of the chest, properly performed by trained radiologists and other physicians, permits the detection of extensive pulmonary lesions, many of them not detectable by ordinary physical examination. However, fluoroscopic examination alone causes one to overlook approximately 20 per cent of "positive" cases, including cases of active pulmonary tuberculosis. (Voigtlander, Wolf: Roentgenpraxis 7: 433 [July] 1935. Licht, Eric de Fine: Acta radiol. 17: 105 [April] 1936. Dunham, Kennon: Am. J. Roentgenol. 1925 and following volumes). The detection of minimal cases of tuberculosis requires the combination of competent roentgenographic examination, occasional fluoroscopic examination, and correlation of the results with associated clinical and laboratory data.

L. H. Garland, M.D., San Francisco.

BODY ODOR

To the Editor:—In Queries and Minor Notes, Jan. 27, 1940, page 346, there is a discussion headed "Body Odor, or Bromidrosis." This almost certainly is a neurotic reaction to a normal odor. All the evidence for this conclusion is present in the inquirer's letter. His question would be better answered by a psychiatrist.

Franklin C. McLean, M.D., Chicago.

To the Editor:—In Queries and Minor Notes in the Jan. 27, 1940, issue of The Journal, on page 346, the answer to the inquiry regarding body odor or bromidrosis, although adequate in some respects, does not in my estimation fully cover the other possibilities presented. In the first place, the doctor presenting the question has stated that although he has seen the patient on several occasions he could note nothing more than the usual odor present around the perineum. It seems to me that the possibility of this condition being entirely subjectively present has been overlooked, and no consideration has been given in the answer to a condition, although rare, which is sometimes seen in women who have symptoms of a hippocampal gyrus or uncinate process tumor along the olfactory tract. In these cases hyperosmia or offensive odor is induced by the patient alone and cannot be substantiated, since the reception of this so-called smell is of central origin. Another condition, although the patient is rather young for it, which might have been mentioned is that of psychotic disturbances associated with the menopause.

Ludwig G. Lederer, M.D., Chicago.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, February 17, page 605.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part II, May 1-2; Part III, June or July, to be given in medical centers having five or more candidates desiring to take the examination. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Oral. Part II, New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. If a sufficient number of applications are received before March 1 there will be an examination at New York, June 10-14. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathologic examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 7-10. Applications for admission to Group A, Part II, examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Oral. New York, June 8-10; Cleveland, Oct. 5. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Memphis, Tenn., Nov. 17, preceding the annual meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Cincinnati, May 17-18. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: New York, June 7-10. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., Rochester, Minn.

AMERICAN BOARD OF SURGERY: Various centers, April 1. Sec., Dr. J. Stewart Rodman, 225 South Fifteenth St., Philadelphia.

California August Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held at Los Angeles, Aug. 8-10, 1939. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. Seventy-seven candidates were examined, seventy of whom passed and seven failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1938) 75.9,	(1939) 75,	
76.3, 77.3, 77.7, 78.2, 79.2, 79.2, 79.3, 79.7, 80.6, 82,			
82.6, 82.6, 82.7, 82.8, 83.2, 84.1, 84.3, 85.9			
Stanford University School of Medicine.....	(1936) 75, (1937) 79.8,		
(1939) 75, 75.1, 78.1, 84.1			
University of California Medical School.....	(1939) 81.3,		
82.3, 83.2, 84, 85.4			
University of Southern California School of Medicine..	(1939) 78.6,		
79, 79.3, 81, 82, 82.1, 82.2, 82.3, 82.7, 83, 83.1, 83.2,			
83.6, 84.2, 84.4, 84.9, 85.8, 86.1, 86.9, 87.1			
University of Chicago School of Medicine.....	(1939) 82.7		
University of Minnesota School of Medicine.....	(1938) 82		
University of Michigan School of Medicine.....	(1939) 85.7*		
University of Illinois School of Medicine.....	(1939) 82.1†		
University of Wisconsin School of Medicine.....	(1938) 78		
University of Louisville School of Medicine.....	(1938) 83.2		
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1938) 83.4		
Wayne University.....	(1939) 81.7		
University of Minnesota School of Medicine.....	(1939) 80.9		
Washington University School of Medicine.....	(1938) 81		
Creighton University School of Medicine.....	(1938) 75.9		
New York University College of Medicine.....	(1939) 80.6		
Western Reserve University School of Medicine.....	(1939) 84.6		
University of Oregon Medical School.....	(1939) 81.8		
Temple University School of Medicine.....	(1937) 86.1,		
(1939) 77.7			
McGill University Faculty of Medicine.....	(1938) 79.8		
Medizinische Fakultät der Universität Wien.....	(1930) 82		
Universiteit van Amsterdam Geneeskunde Faculteit.....	(1932) 79.2		

School	FAILED	Year Grad.	Per Cent
University of Arkansas School of Medicine.....	(1938) 71.8		
College of Medical Evangelists.....	(1939) 73.8,		
Rush Medical College.....	(1938) 76.3‡		
Medizinische Fakultät der Universität Wien.....	(1936) 71.6		
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....	(1903) 74.8		
Latvijas Universitāte Medicīnas Fakultāte, Rīga.....	(1928) 55.6		
			67.4

* This applicant has received an M.D. degree and will receive an M.D. degree on completion of internship.

† This applicant has completed four years' medical work and will receive an M.D. degree on completion of internship.

‡ Fell below 60 in two subjects.

California October Report

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held at Sacramento, Oct. 17-19, 1939. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. Fifty-six candidates were examined, fifty-three of whom passed and three failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939) 79.7, 81.4, 84.2	84.3	
Stanford University School of Medicine....	(1935) 84.2, (1938)	86.7	
University of California Medical School.....	(1938) 82.3, (1939) 81.6, 84.6, 88.2	82.3	
University of Southern California School of Medicine..	(1939)	86.8	
Howard University College of Medicine.....	(1939)	75	
Northwestern University.....	(1939)	82, 89.1*	
Johns Hopkins University.....	(1939)	80.3	
University of Minnesota Medical School.....	(1938)	86.7*	
St. Louis University School of Medicine.....	(1939)	87.3	
Creighton University School of Medicine.....	(1937)	78.8,	
(1939) 75.8, 85.1, 85.6			
University of Nebraska College of Medicine.....	(1939) 84.1,	85.7	
Long Island College of Medicine.....	(1939)	83.7	
University of Oregon Medical School.....	(1939) 76.7,	79	
University of Tennessee College of Medicine.....	(1939)	79.7	
University of Wisconsin Medical School.....	(1935)	79.7	
University of Alberta Faculty of Medicine.....	(1938)	82.8	
McGill University Faculty of Medicine.....	(1921) 85.4, (1935)	82.6,	
(1938) 80, 80, (1939) 75.8, 79.6, 79.8, 80.7, 83.1,			
85.3, 86.9, 87.3, 87.3, 87.6			
Medizinische Fakultät der Universität Wien.....	(1914)	89.8,	
(1932) 76.1, (1935) 78			
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England.....	(1928)	89.3†	
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....	(1903)	97.1	
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....	(1916) 78.9, (1922)	84.6	
Universität Heidelberg Medizinische Fakultät.....	(1915)	75.6	
Univetytet Jana Kazimierza Wzdzial Ledarski, Lwów.....	(1935)	88,	
(1936) 80.9			
School	FAILED	Year Grad.	Per Cent
Hahnemann Medical College and Hospital of Philadelphia.....	(1939)	73.6	
Universita Karlova Fakulta Lékařská, Praha.....	(1936)	46.6	
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....	(1931)	66.6	

Fifty-one physicians were licensed by reciprocity and ten physicians were licensed by endorsement from September 27 through December 7. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine....	(1924), (1938)		Colorado
University of Georgia School of Medicine.....	(1934)		Georgia
Northwestern University Medical School.....	(1924)		Illinois, Kentucky
Rush Medical College.....	(1931), (1933), (1935)		Illinois,
(1936) Michigan			
The School of Medicine of the Division of Biological Sciences.....	(1934)		Illinois
University of Illinois College of Medicine.....	(1930)		Idaho
Indiana University School of Medicine.....	(1934, 2)		Indiana
State University of Iowa College of Medicine....	(1927, 2)		Iowa
University of Kansas School of Medicine.....	(1930)		Kansas
Tulane University of Louisiana School of Medicine....	(1930)		Mississippi,
(1934) Minnesota			
Johns Hopkins University School of Medicine.....	(1938)		Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1936)		Maryland
University of Minnesota Medical School.....	(1925)		S. Dakota,
(1934) Minnesota			
St. Louis University School of Medicine.....	(1918)		Colorado,
(1936) Illinois, (1938) Missouri			
..... School of Medicine.....	(1926)		Kansas,
..... School of Medicine.....	(1927)		Minnesota,
..... School of Medicine.....	(1926)		Ohio,
(1938, 2) Nebraska			
Columbia University College of Physicians and Surgeons.....	(1915)		New Jersey
Long Island College Hospital.....	(1920)		New York
University and Bellevue Hospital Medical College....	(1919),		
(1930) New York			
Ohio State University College of Medicine.....	(1938)		Ohio
University of Oklahoma School of Medicine.....	(1928)		Oklahoma
University of Pennsylvania School of Medicine.....	(1929)		Utah,
(1934) Pennsylvania			
Meharry Medical College.....	(1935)		Illinois
Vanderbilt University.....	(1891)		Oregon
..... Medical College.....	(1913)		Penna.
..... Medical College.....	(1928)		Virginia
Medical College of Virginia.....	(1936)		Wisconsin
University of Wisconsin Medical School.....	(1930)		N. Dakota
University of Manitoba Faculty of Medicine.....	(1930)		
School	LICENSED BY ENDORSEMENT	Year Grad.	of
College of Medical Evangelists.....	(1936), (1937)	(1938, 3)	N. B. M. Ex.
University of Illinois College of Medicine.....	(1939)		U.S.P.H.S.
Johns Hopkins University School of Medicine.....	(1934)		N. B. M. Ex.
Harvard Medical School.....	(1933)		N. B. M. Ex.
St. Louis University School of Medicine.....	(1937)		N. B. M. Ex.
University of Oregon Medical School.....	(1933)		N. B. M. Ex.
* This applicant has received an M.B. degree and will receive an M.D. degree on completion of internship.			
† License has not been issued.			

Book Notices

Modern Clinical Psychiatry. By Arthur P. Noyes, M.D., Superintendent, Norristown State Hospital, Norristown, Pennsylvania. Second edition. Cloth. Price, \$5. Pp. 570. Philadelphia & London: W. B. Saunders Company, 1939.

The author who wishes to write a useful book on psychiatry is confronted with the problem of how much to include. Encyclopedic textbooks of psychiatry similar to those which are so readily available in internal medicine and surgery seem as yet to have no place in the library of the psychiatric student. Since the subjects covered by the conventional textbooks of mental medicine are more or less the same, the value of such books must rest on their modernness, the fluency of their presentation and the interest engendered thereby, as well as the accuracy of the facts presented. The first edition of Noyes's textbook stood out. It had all the characteristics which are indispensable for satisfactory textbooks, and the selection of matter as well as the style were better than those in most of the other psychiatric works. The present edition has been somewhat improved. Some of the contents have been brought down to date, in fact, so much so that the chapter on schizophrenia closes with several excellent pages dealing with shock treatment of that disorder, a development largely of the past two years. In spite of the fact that nonhospital psychiatrists, of whom there are now a large number, have to deal with conditions other than the psychoses, the majority of chapters of Noyes's book deal only with those major mental disorders which usually require hospitalization. Only the last three chapters are of any value to the general medical man or to the psychiatrist who has to deal with conditions which might be seen in an outpatient department of a hospital or in the private office. There is no chapter on child guidance. There is little on criminology except what is included under psychopathic personality. The presentation of hospital cases, of the frank psychoses and of that material which forms the groundwork of psychiatry, however, is satisfactory and this book ranks well up with the other textbooks recommended for students of the subject written in the field of psychiatry.

The Larval Trematoda Found in Certain South African Mollusca with Special Reference to Schistosomiasis (Bilharziasis). By Anne Porter, D.Sc., F.R.S.S., F.L.S., Research Associate in Zoology, McGill University, Montreal. Publications of the South African Institute for Medical Research No. XLII (Vol. VIII). Paper. Pp. 492, with 2 illustrations and 83 plates. Johannesburg, 1938.

Schistosomiasis is a widespread disease of man, other mammals and birds. It is due to infection by adult flukes which live in the blood stream and whose abundant eggs lodge in the capillaries of the bladder and intestine, producing local inflammation and not infrequently resulting in neoplasms. The eggs, discharged in urine or feces, hatch in water into free-swimming miracidia, which bore into fresh-water snails, pass through larval stages and emerge as fork-tailed free-swimming cercariae, which pierce the skin of the vertebrate host and find the blood stream, in which they complete the complicated life cycle.

All public health measures in prophylaxis and local eradication of the disease rest on the zoologic knowledge of the habits, life history, ecology and immunology of both the parasite and its intermediate host or hosts, for the fluke adapts itself to various mollusks.

This debilitating and potentially dangerous infection of man depends for its continuance on insanitary habits of infected persons whose urine and feces continuously containing fluke eggs are deposited in or otherwise find their way into bodies of water in which the snail hosts feed and breed. These same waters are usually the sources of water for drinking, and also the public laundry and bathing resort of young and old. Thus the vicious circle is maintained.

The biologic intricacies of the blood fluke problem appear in the following facts: There are two prevalent types of the disease, the urinary and the intestinal, due to two different flukes, *Schistosoma haematobium* and *S. mansoni*, living as larvae in different snails. The two diseases, the two flukes and the varied molluscan hosts are spread over the whole of watered inhabited South Africa as well as widely over the tropics, and a third fluke, *S. japonicum*, is repeatedly brought in by Orientals in shipping and travel. Further complications arise from the facts that the snail hosts have also other fluke infections and that other snails

may be susceptible to the infection. Man is liable also to be attacked by the skin-penetrating cercariae of the flukes parasitic in other mammals which give rise to swimmers' rash. It is virtually impossible to exclude snails from public water supplies and natural waters used for bathing. Copper sulfate in the ratio of 1 to 500,000 or even 1,000,000 is effective in killing most of the snails.

The author's recommendations based on biologic evidence include prevention of contamination of public waters by human feces and urine, protection of the individual from infection, and destruction of the molluscan hosts and of the infective cercariae. The first can be accomplished by sanitation in modern cities but is difficult with illiterate and uninstructed native peoples with established modes of life and no sanitary conveniences. The second means providing cercariae-free water from deep wells for bathing consists of allowing the snail-free water to stand seventy-two hours before use, since the larvae die within that time after leaving the snail. The treatment and cure of all infected persons will also accomplish the same end locally and for a time. The last can be carried out largely by engineering control of all artificial waters in which periods of drought can be utilized to kill off the snails and reduce the water to areas available for treatment with copper sulfate. The disease in man yields to continued use of antimony and potassium tartrate.

This book is a mine of information on fluke infections of snails. The text and illustrations record and picture no less than 112 different cercariae from twenty-eight species of South African mollusks. There are also fully illustrated accounts of the morphology, larval stages, intermediate hosts and ecology of the schistosome flukes of man and his domestic animals. Experimental work on modes of infection, behavior and immunologic reactions is included. The book is a superb piece of parasitologic work in one of the most important fields of human parasitology carried out with a broad vision of the most essential biologic principles involved, with a wealth of detail and a high degree of accuracy.

Sport, Physical Training and Womanhood. By Stephan K. Westmann, M.D., L.R.C.S., L.R.C.P. With a foreword by Sir Kaye Le Fleming, M.A., M.D., Member and Vice-Chairman, Medical Sub-Committee, National Fitness Council, England. Cloth. Price, \$4. Pp. 222, with 73 illustrations. Baltimore: William Wood & Company, 1939.

This astonishing volume, written by a physician who appears to have been trained in Germany, impels the reader to turn to the title page to discover whether its date is 1889 but he finds it printed as 1939. Further, he discovers that the author is set down as eminent both as an obstetrician and as an athlete. But his astonishment is abated no whit, for the author's principal thesis is that girls and women should not engage in competitive sports lest their child bearing be made impossible or difficult. This thesis is supported by statements such as the following: "The champion of today, in all probability, has already suffered injuries that will bring her tomorrow to a doctor's consulting room . . . with health shattered." "Many competitive sports necessitate sexual abstinence for men while training."

"Too much activity in sports of a masculine character causes the female body to become more like that of a man. This holds good . . . in regard to the genital organs, for they tend to decay." It is stated in all seriousness that tennis is a dangerous game for a woman, particularly if she is menstruating, because a swiftly moving tennis ball, striking her abdomen, might cause injury to the organs of the lower part of the abdomen. Few persons who have played tennis regularly for forty years have ever been struck in the abdomen by a swiftly moving tennis ball and it would do nothing but make the skin smart if they were. The ball is a light one.

When discussing riding, the author ventures the thought that the side saddle tends to a somewhat strained posture. As a good sport for women he suggests lacrosse, one of the most dangerous and violent games played by our young men. One shudders at the thought of a lacrosse stick striking a woman in the abdomen.

The author's entire trend of thought is foreign to the line of progress in the United States during the last fifty years, although it may be more acceptable for Germany. He is quite right in stating that competitive exercise may be overdone by women—or men. His general presentation of the effects of competitive exercise on women is quite unconvincing to an American.

On one page he attempts to demonstrate that physical activity reduces the size and changes the shape of the pelvis so as to make child bearing difficult. On another page he recalls to our minds that only civilized and modern women have such difficulties and that childbirth among primitive women was a simple and relatively easy physiologic function. In the name of all that is true and beautiful, what were the physical activity habits of those primitive women? They may not have ridden side saddle but they have been charged with being continuously active. Some good exercises for use during pregnancy and the puerperium are given in the latter part of the book, but there are so many inaccuracies, inconsistencies and anachronisms that the reader must lose confidence in the good material also.

Cancer of the Larynx. By Chevalier Jackson, M.D., Sc.D., LL.D., Consultant in Broncho-Esophagologic Research, Temple University Medical School, Philadelphia, and Chevalier L. Jackson, A.B., M.D., M.Sc., Professor of Broncho-Esophagology, Temple University Medical School. Cloth. Price, \$8. Pp. 309, with 239 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

The authors in the preface explain the division of the book into three parts under the headings of procedures, general considerations and historical notes as being an attempt to furnish information from three different points of view. In the first instance their aim is to present briefly such practical information as may be applicable to a particular case in hand. The second division provides a broader basis for study, for comparison of results by methods and for expanding the reader's knowledge through a discussion of pathology, diagnosis, borderline cases and subjects that are still of a controversial nature. The third part of the book is designed to round out the picture by detailing the historical development of our knowledge of this fascinating subject. Needless to say, the authors have done a good job. Stripped of nonessentials, the consensus of our present day knowledge of cancer of the larynx is presented in orderly fashion so that he who runs may read and profit. In addition to Jackson's subperichondrial laryngofissure, which the authors have long favored and with which they have had remarkable success, they present the details of both "narrow field" and "wide field" laryngotomy as well as the modifications which have been in vogue from time to time. The chapter on articulate speech after laryngectomy, though brief, furnishes considerable information in this perplexing subject, and the chapter on treatment of cancer of the larynx by irradiation is marked by a sane and cautious consideration of what is still a moot question. As might be expected, Jackson's colored drawings of the laryngeal picture under various states of disease are present in sufficient number to delight the eye and stimulate the observer to more careful observation and appreciation of the images he sees in his mirror. This excellent little book successfully bridges the gap since Thompson's publication in 1930 and brings the laryngologist's library down to date in a vital and absorbing topic.

The Measurement of Adult Intelligence. By David Wechsler, Chief Psychologist, Bellevue Psychiatric Hospital, New York. Cloth. Price, \$3.50. Pp. 229, with 12 illustrations. Baltimore: Williams & Wilkins Company, 1939.

The author points out that for some time there has been a distinct need for good tests of adult intelligence. The modified Binet test contains a poor means of differentiation between the smart and the dull adult, although the dull adult, of course, can be compared with a child. With the help of some Works Progress Administration workers and his own staff, Wechsler at the Bellevue Psychopathic Hospital in New York has developed a new scale which is especially adapted for the evaluation of adult intelligence. In discussing some of the factors involved in measuring adult intelligence the author goes on to explain some of the details which were elicited by developing the present scale. For instance, one of the things that are noticeable is that test results in an adult scale decrease with age. There are other factors which apparently have never been adequately studied on adults, which Wechsler has studied. While many of the tests on this scale are modified from the older Binet scale and the performance scales in general use in clinics and mental hospitals, he has added some which are specific to the present method of measuring. One of these is a good general knowledge test. Various facts of the scale have been adequately validated according to methods which are commonly used. The author shows a few special statistical methods in a part of the

book devoted to the subject. The test apparently is quite reliable. Wechsler devotes considerable time to a discussion of the selection and description of the test, the population used in standardizing the test, the results of standardization, and the limits and special merits of the scale. He also has tables which are used in the easy determination of the intelligence quotients. All in all, the author presents a new technic which should be of some value to psychiatrists who have bemoaned the lack of the means of evaluating that trait which is so necessary of evaluation but so little understood—general adult intelligence. The present test certainly is a step forward, providing the psychologist working with the psychiatrist another tool in the diagnosis of mental patients.

Protozoology. By Richard Roksabro Kudo, D.Sc., Associate Professor of Zoology, the University of Illinois, Urbana. Second edition of Handbook of Protozoology. Cloth. Price, \$6.50. Pp. 689, with 291 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

This new edition of the author's Handbook of Protozoology (1931) has been completely rewritten, reset and greatly enlarged. Whereas the first edition had 175 illustrations showing 1,463 figures, this edition has 291 illustrations with 2,711 figures. As now constituted it offers the content of textbook, laboratory manual, reference work and an atlas of the free-living and parasitic Protozoa. The first six chapters treat of the ecology, morphology, physiology, reproduction and variation and heredity of the Protozoa, and chapters 7 to 43 give a systematic analysis of the families, many of the genera, and the more significant and representative species of this marvelously diverse group of so-called simple organisms. It is a valuable work of reference for every medical library.

Practical Obstetrics. By P. Brooke Bland, M.D., Consulting Obstetrician, Jefferson Medical College Hospital, Philadelphia, Pa., and Thaddeus L. M. [unclear], M.D., Clinical Professor of Obstetrics, Jefferson Medical College, Philadelphia, Pa. Third edition. Cloth. Price, \$8. Pp. 877, with 120 illustrations. Philadelphia: F. A. Davis Company, 1939.

A critical review of the previous edition of this book was published in THE JOURNAL Feb. 2, 1935. In rewriting and revising the book for the present edition, the authors gave consideration to some of the points mentioned in the previous review. In this revision, particular attention has been given to the chapters on toxemias of pregnancy, endocrine physiology, obstetric anesthesia and the treatment of the newborn. This edition contains 502 engravings, including twenty-seven colored plates, whereas the second edition contained twenty-one colored plates. The illustrations in general are good. As the book is intended primarily for students, the authors have kept in mind brevity and directness. That the text has been brought abreast of the time is shown in the chapter on the treatment of puerperal complications by means of sulfanilamide, which the authors say is of value in septic puerperal complications when infection is due to the streptococcus; however, its effect and action should be closely watched, in view of the untoward reactions that occur in some cases. The final chapter, entitled "Obstetric Jurisprudence," precedes the section on referred reading, which gives the references that were consulted in the preparation of the book. This edition contains a few more pages than the second edition, but it remains a handy and good-looking volume.

Microbiology and Pathology. By Charles F. Carter, B.S., M.D., Director, Carter's Clinical Laboratory, Dallas, Texas. Second edition. Cloth. Price, \$3.25. Pp. 735, with 190 illustrations. St. Louis: C. V. Mosby Company, 1939.

This textbook, written primarily for student nurses, is largely devoted to bacteriology. Considerable space is devoted to general principles and methods, which are described in simple form. The portion discussing pathology for schools of nursing of high standards is somewhat deficient in text on the general phases. The chapters on special pathology include descriptions of laboratory observations, which in most books are usually segregated under clinical pathology. Illustrations are numerous and include twenty-five good colored plates. Each chapter ends with a list of helpful questions for review. A glossary of common medical terms is a useful addition. It is difficult to evaluate books for nurses, as the courses in bacteriology and pathology vary considerably; but, on the whole, this volume will meet the requirements of most training schools.

A Textbook of Pathology for Nurses. By Coleman B. Rabin, B.S., M.D., Associate in Medicine and Assistant Radiologist to the Mount Sinai Hospital, New York. Second edition. Cloth. Price, \$1.75. Pp. 260, with 68 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

The material is presented by the author in an elementary manner so that the fundamentals of pathology can be readily grasped by nurses. There is a departure from the usual style of compiling textbooks on pathology, as the author endeavors to stress the pathologic physiology of diseases in which nursing has an important part. The chapters on ulcers, obstruction of the gastrointestinal tract and obstruction of the urinary tract demonstrate this point. In spite of these features the treatment of the material is somewhat inadequate. Diseases of the central nervous system, the blood and the blood forming organs are barely mentioned. The chapter on clinical pathology is similarly short and inadequate. However, the numerous illustrations and diagrams add considerably to the value of the contents.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Negligence in Treatment After Conization of the Cervix.—The plaintiff suffered from a retroverted uterus, an eroded and encysted cervix, appendicitis and dysmenorrhea. The defendants performed an operation on her Feb. 17, 1934, consisting of the removal by electrosurgery of a conical-shaped portion of the lower end of the cervix, in the region of the external os, after which the cervix was packed with iodoform gauze. An abdominal operation was then performed for the suspension of the uterus and the removal of the appendix. Alleging that subsequent disabilities experienced by the plaintiff were due to the negligence of the defendants in performing the conization operation, the plaintiff brought suit and obtained a judgment for \$7,500, from which the physicians appealed to the Supreme Court of Iowa.

From the record, said the Supreme Court, it was evident that in an operation of the kind performed on the plaintiff raw surfaces are left around the cervical canal, and if nothing is done to prevent them coming in contact they will occlude and close the canal. The evidence showed that the only thing done to keep the canal open was to place gauze in it, which was removed a day or two after the operation. From the date of the operation until the time that the plaintiff left the hospital nineteen days later, the jury could have found from the evidence, the court said, that, with the exception of the removal of the gauze, there was no examination of the cervix, no treatment of the wound and nothing done to hold apart the raw surfaces. The following April, May and June the plaintiff had periods of intense suffering, and on June 24 she applied to the defendants for relief. At that time the cervical canal was opened with dilators, no anesthetic being given. The plaintiff was in the hospital about twenty-four hours at that time. Again in July and in August she suffered cramps with great intensity and severity in length of time. She again appealed to the defendants for aid on August 11 and at that time the cervix was "grown over with the same sort of scar tissue as before." Again the cervical canal was opened with a dilator, without the use of an anesthetic, but no precaution was taken to prevent future occlusion. November 25, the plaintiff returned to the defendants for treatment, but she refused to go to the hospital for the purpose of again having the cervical canal opened up, stating that she could not stand the pain. She apparently returned home without any treatment. Early in December 1934 another practitioner attempted to establish an opening in the cervical canal but was not successful and thereafter removed the uterus.

The defendants complained that the trial court erred in submitting to the jury, as a basis for finding the defendants liable, the subsequent treatment following the plaintiff's discharge from the hospital in 1934. But, the court said, the petition did not limit the treatment to the time the plaintiff was in the hospital.

She employed the defendants to treat her until she had recovered. The defendants knew that the operation necessitated a long subsequent period of treatment in order to effect a cure. The site of the operation required inspection, to see whether the wound was healing properly; it required "dressing," and this was the duty and responsibility of the defendants.

A medical witness testified that the procedure and methods used by the defendants were not those ordinarily used; that it was essential for the canal to be kept open and for keeping the canal open various methods were used, and that inspection had to be made frequently to see that the canal was kept open. While there was some conflict in the testimony on the part of the other physicians who testified on behalf of the defendants, the question was one for the jury. The defendants further argued that the trial court erred in failing to instruct the jury properly relative to the plaintiff's burden of showing the necessity of removing the uterus. It was the defendants' theory that the jury, in determining the matter of necessity, should consider only opinions of experts regardless of whether or not the experts themselves had fixed any standard of necessity. One physician, said the court, might say that what was necessary was to be gaged by whether the plaintiff's life depended on a certain course. Another might think that necessity should be gaged by whether the plaintiff's intense discomfort or pain could be avoided by the removal of the uterus. Still another physician might think that preservation of the ability to bear children was more important than the risk of death or long suffering and therefore that the plaintiff should be subjected to a risk of death or long suffering rather than have the uterus removed. For this reason, the court pointed out, the opinion of physicians as to the fact of necessity is not controlling on the jury. The jury is well able to say whether the preservation of life, the freedom from long pain or suffering or the preservation of the power to bear children, regardless of the risks that might accompany it, shall be the standard of necessity.

The defendants finally objected to the testimony of a physician who lived in a community some 70 miles from the one in which the operation was performed, on the ground that the witness was not qualified to testify. But, said the court, the undisputed evidence showed that the witness was qualified in all respects regarding his knowledge of this particular type of operation and his testimony showed the standard of practice of the general locality surrounding the city of operation. To lay down a rule, the court said, that no one could testify except a physician from the particular town in which the medical man being sued lived would be unfair and unreasonable. A physician is bound to exercise that skill and care ordinarily possessed under like circumstances, not merely in the same community but in like localities.

The court could find no error in the record, and the judgment for the plaintiff was affirmed.—*Kirchner v. Dorsey & Dorsey (Iowa)*, 284 N. W. 171.

Medical Practice Act: Charter of State Naturopathic Association Inadmissible as Evidence.—One C. L. Hawkins was convicted of practicing medicine without a license and appealed to the court of criminal appeals of Texas.

The medical practice act of Texas provides that any person shall be regarded as practicing medicine within the meaning of the act:

1. Who shall publicly profess to be a physician or surgeon and shall treat or offer to treat any disease or disorder, mental or physical, or any physical deformity or injury, by any system or method, or to effect cures thereof.

2. Who shall treat or offer to treat any disease or disorder, mental or physical, or any physical deformity or injury, by any system or method, or to effect cures thereof and charge therefor, directly or indirectly, money or other compensation.

It was not necessary, said the court, for the information to charge that Hawkins publicly professed to be a physician and surgeon and offered to treat any disease or injury, mental or physical; it was sufficient for it to charge that he treated or offered to treat as set forth in the second quoted subparagraph. The information might have charged in the language of either or both subparagraphs, because if Hawkins did the things mentioned in either he came within the statutory definition of what constitutes the practice of medicine. Furthermore, the information did not have to negative the exceptions contained in the

medical practice act; if Hawkins came within any of the exceptions he could offer that fact as a defense.

The evidence showed that Hawkins had a sign in his yard which read as follows:

Dr. C. L. Hawkins, Telephone Number 87-3646, Chiropractor, Naturopathic, Toxine Elimination, Exercise and Health Diet and Health Service.

A person suffering from pulmonary and intestinal tuberculosis applied to Hawkins for treatment and on two different occasions Hawkins supplied the person with medicine, advising him to take a spoonful each morning and night. For this treatment the person paid \$4 on one occasion and \$3 and some cents on another. In the opinion of the court, this evidence was sufficient to sustain the conviction.

Hawkins complained because the trial court declined to permit him to offer in evidence the Charter of the Texas State Naturopathic Association. The appellate court was unable to understand on what theory this document might have been admissible. A charter granted to an association by the Secretary of State, the court said, would not authorize any one to engage in the practice of medicine without having complied with the medical practice act; nor could it relieve any one from prosecution for a violation of that act.

Finding no reversible error in the record, the court of criminal appeals affirmed the judgment of conviction.—*Hawkins v. State (Texas)*, 125 S. W. (2d) 580.

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State, 16-18. Dr. D. L. Cannon, 519 Dexter Ave., Birmingham.
American Association for the Study of the Nervous and Mental System, Apr. 15-17. Dr. W. Blair Mosser, 133 Bidwell St., Berkeley.
American Association of Anatomists, Louisville, Ky., Mar. 20-22. Dr. E. R. Clark, Dept. of Anatomy, Univ. of Pennsylvania School of Medicine, Philadelphia, Secretary.
American Association of Pathologists and Bacteriologists, Pittsburgh, Mar. 21-22. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.
American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.
American Society of Pathology, New Orleans, March 13-16. Dr. Philip B. Gerson, Baltimore, Secretary.
American Society of Pathology, University of Chicago, Chicago, Secretary.
American Society for Pharmacology and Experimental Therapeutics, New Orleans, March 13-16. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.
American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie R. Kober, 15 East Monroe St., Phoenix, Secretary.
Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
Federation of American Societies for Experimental Biology, New Orleans, Mar. 13-16. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.
Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 9. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glen Bell, University of California Hospital, San Francisco, Secretary.
Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH

Twelfth Annual Meeting, Held in Chicago, Nov. 3 and 4, 1939

(Concluded from page 614)

Treatment of Climacteric Symptoms with Stilbestrol

DR. ELMER L. SEVRINGHAUS, Madison, Wis.: Continuing the comparison of different estrogenic substances for the relief of menopausal symptoms, it has been found possible to get complete relief in each case tested by the oral administration of the synthetic estrogen stilbestrol. A group of seventeen women have been observed over a total of seventy-five months of treatment, with the average duration of therapy four and one-half months. The individual patients received the medication for from two to eight months each. A wide range of doses has been tried, from minimum levels of 0.1 mg. a day to a maximum of 15.0 mg. a day. In only three cases was the dose of 5.0 mg. exceeded, and in only two was more than

5.0 mg. needed to continue the relief. With only one patient has there been relief from use of less than 0.5 mg. a day. The effective dose range seems therefore to be from 0.5 to 5.0 mg. daily.

Test of the adequacy of treatment by the vaginal smear shows stilbestrol to be very potent. Doses ranging from 0.5 to 5.0 mg. maintained the presence of cornified cells in a state of maturity comparable to that of the normal midinterval smears in the period of fertility. The stimulation of endometrial activity was more marked than has been the common experience with naturally occurring estrogens, as shown by the occurrence of postmenopausal bleeding in at least four of the seventeen women. In two of these the bleeding has been so bothersome that treatment was discontinued for a period.

Significant complications which have necessitated discontinuance of medication include only nausea, headache and lassitude. These symptoms have been relieved by reducing the dosage, without sacrificing clinical control. In three cases exception to this statement must be made because of the gradual development of persistent headache in one, of nausea in another and of marked lassitude in the third. These "toxic" manifestations appeared only after months of satisfactory use of the drug in 0.8, 1.0 and 5.0 mg. doses. Relief from the symptoms was secured after a number of days with no stilbestrol and return to natural estrogen therapy.

The benefits noted in this series include relief from autonomic and mental disturbances as completely as is the case with natural estrogen therapy. None of the women treated have been in a state of involutional melancholia requiring institutional care. No objective tests for liver, kidney or bone marrow function are included in this study, but nothing about the clinical course has suggested damage to these organs. Anemia has not been a feature of the toxic manifestations. Extended studies of long time use of stilbestrol seem indicated, with tests of renal and hepatic function before and after the drug is administered.

DISCUSSION

DR. C. M. MACBRYDE, St. Louis: I can report observations which confirm in all essentials those reported by Dr. Sevringhaus. Eight months ago I started studies on diethylstilbestrol, and I have to date studied the results of treatment in thirty-seven cases of hypo-ovarianism. Each patient has been treated for at least one month, and several have been treated for eight months continuously. Of the thirty-seven patients twelve had had both ovaries removed and five part but not all of the ovarian tissue removed, five patients were of eunuchoid type with marked hypogonadism and amenorrhea, and fifteen were patients with severe symptoms of the spontaneous menopause. Diethylstilbestrol proved to be a potent estrogen when given either parenterally or orally. I have followed the vaginal smears at weekly intervals in a large number of cases and have found that estrous changes can be produced at will. The endometrium also shows definite effects as demonstrated by biopsies taken at intervals. In some instances the estrus effects can be obtained with only a few tenths of a milligram a day, and in others it takes several milligrams daily. The largest dose used was 5 mg. daily by injection. Minor toxic effects were noted in a small number of cases. I have not observed the high incidence of toxic effects which have been reported by some observers. Nausea occurred in about 20 per cent of the series and vomiting in three cases, but these symptoms ceased when the dose was reduced. To two patients the preparation has been administered in daily doses of 5 mg. by injection for six months without any signs of toxicity. The average dose employed in the series was 1 mg. by mouth or by injection daily. No cutaneous reactions were observed. No evidence of renal damage as shown by repeated urine examinations was observed. Repeated estimations of red blood cells, white blood cells, platelets and hemoglobin during and after treatment showed no variations from normal. Liver function studies have been performed in a few cases in which the largest doses were administered and treatment was given for the longest periods. So far I have failed to find any evidence of disturbed hepatic function. The tests employed were those of bromsulphalein excretion and hippuric acid synthesis. In none

of the cases has it been necessary to withdraw the preparation because of toxic manifestations. Nausea occurred after both oral and parenteral treatment but most often after injections. Changing from parenteral to oral treatment or reducing the size of the dose has so far always resulted in cessation of nausea. I have shown that subcutaneous implantation of hard pellets weighing about 100 mg. will give slow absorption with continuous mild estrous effect. The rate of absorption is about 0.1 to 0.2 mg. a day, which is equivalent to from 2,000 to 4,000 international units daily. The material seems to be more effective per milligram absorbed by pellet implantation than by injection or by mouth. These small "artificial ovaries" can be left in place for weeks or months without any untoward local reaction. They may provide a practical method for prolonged administration of small amounts of estrogenic material. If a larger dose is desired, several pellets may be implanted. I want to emphasize with Dr. Sevringhaus the possible toxic effect of this material. Animal experiments have shown that very large doses can produce liver damage and can inhibit blood formation and cause bone marrow changes. So far with therapeutic doses no such changes have been observed in patients. Nevertheless, this material should be very carefully studied before its use is widely encouraged.

DR. FRANK N. ALLAN, Boston: I can add confirmation to Dr. Sevringhaus's report with regard to the efficacy of stilbestrol. At the Lahey Clinic we have used it in forty-five cases, and I have analyzed the results in twenty-six. In twenty-four cases there was definite relief of symptoms of the menopause. In two cases treatment was discontinued because of toxic symptoms before there was time to evaluate results. In these cases treatment was begun with 1 mg. daily. In ten cases there were toxic symptoms of some degree; in all the symptoms were mild: nausea, rarely vomiting, abdominal discomfort and malaise. None of these symptoms were serious, but the fact that they have occurred so frequently must make one cautious about indiscriminate use. The material is effective when given orally, by injection and as an inunction. In two cases we have observed decided effects from inunction. Administration orally or by inunction may eliminate the need for intensive treatment by injections, sometimes required with severe menopausal symptoms.

DR. SAMUEL SOSKIN, Chicago: My experiences have been similar to those of Dr. Sevringhaus. A word about toxicity: I have found in a group of thirty cases that two or three showed mild symptoms of nausea and gastrointestinal disturbances with oral doses of 1 mg. daily. I hesitated to increase the dose above that because the dose of 1 mg. a day seemed effective in all cases, although with that dose it may take a few more days to get full relief from symptoms. I was also hesitant because of the vague rumors of toxicity passed around by word of mouth. When I started to study the effect of stilbestrol on liver function I found that in some of the treated women there was an increased retention of bromsulphalein. But when I began to study a control group of women before giving stilbestrol I found that a surprising number had some retention of bromsulphalein. It is therefore unfair to judge the toxicity of the drug by liver function tests unless one studies a sufficient number of women in the same age group before and after administering stilbestrol. I found that some patients who had mild bromsulphalein retention before had greater retention afterward, but those with no retention before treatment apparently suffered no liver damage. We may be dealing with a somewhat toxic material which will affect a damaged liver but with which a normal liver can cope very readily. I would suggest that in further evaluations the liver function be tested before one gives the material as well as after.

DR. PAUL STARR, Chicago: I have been using this material in a small way but am not yet ready to report on my observations. I should like to remind you, however, that physicians went through a horrible experience with dinitrophenol a few years ago although that drug had had the most conscientious animal, laboratory and chemical study before its clinical use. One should not be in such a rush to use a new and complicated substance for treatment of ovarian deficiency. I should

like to hear something more said about prolonged animal study on this material, particularly on the primates, if possible. The potentialities of the chemicals to be derived from this hormonal group are so great that I feel physicians are going ahead too fast.

DR. E. PERRY McCULLAGH, Cleveland: I wish to add my support to what Dr. Starr has said. It seems obvious from my clinical experience and from that of others that the toxic effects of this new drug lie very close to the effect which one wishes to obtain physiologically. Distinct experimental evidence of its toxicity has been published. Loeser discusses the damaging effects of this substance in animals in an article in the *Klinische Wochenschrift* of March 1939, and, more recently, Selye in the *Canadian Medical Association Journal* has called attention to the effects of diethylstilbestrol on the livers of rats. It is true that large quantities of the substance were used and that other estrogenic compounds are capable of producing similar damage. However, at present, when the treatment of menopausal symptoms is in a relatively satisfactory state, one should always bear in mind the potential danger of this substance. As far as possible, it would be advisable to obtain adequate information about the effects of the material on bone marrow, liver and kidneys, especially in primates, before the drug is used extensively.

DR. ELMER L. SEVRINGHAUS, Madison, Wis.: In reply to the discussion by Drs. Starr and McCullagh, I think there are some interesting situations before us. We want prolonged study of animals treated with this material and we want studies with primates as well as with rodents. That is expensive. There are not many laboratories that have monkeys to be used in this type of study and not many that are willing to spend money on trying something like this, which has large promise and one tremendous advantage over natural estrogen in that it is one-tenth as expensive. Menopausal treatment in use now is too limited; it is limited to those who can afford it, and such substances should be made available to others.

Influence of Testosterone Propionate on Function of Testes

DR. NORRIS J. HECKEL, Chicago: In persons with normal testicular function, daily intramuscular injections of testosterone propionate of 10 to 25 mg. will depress the number of spermatozoa to such an extent that either oligospermia or azospermia occurs. This depletion of spermatozoa has been observed in fifteen of seventeen patients who were treated for various urologic conditions. However, this effect was only temporary, and when the treatment was discontinued the spermatozoa counts returned to within normal limits. The longest duration of the oligospermia and azospermia was 119 days. In general, the greater the daily dose of testosterone propionate the more rapidly did sterility develop. That is, with 40 mg. daily the sterility occurred much sooner than with 10 mg.

DISCUSSION

DR. EDWARD H. RYNEARSON, Rochester, Minn.: I should like to ask Dr. Heckel if he feels that one should use testosterone propionate in the treatment of undescended testes in boys and whether he has evidence that it will cause damage to the testes of these boys.

DR. W. O. THOMPSON, Chicago: There are two important applications of these observations. It is obvious that an androgen is of no value in sterility. In the second place it should not be used for any patient who has at least one normal testis because of the danger of damaging the normal testis. For this reason it should not be used in the treatment of undescended testes unless both testes are intra-abdominal. It appears more desirable to use stimulation therapy with gonadotropic material for any person in whom the testis is capable of responding to stimulation.

DR. E. PERRY McCULLAGH, Cleveland: I wish to make one point in reply to Dr. Thompson. It has not been proved that it is impossible to produce a striking fall in the sperm count by the use of pregnancy urine extracts. This point should be investigated further. So far as is known, the effect of injection

of pregnancy urine extracts is produced only by the testis hormones secreted from the stimulated gonads. Under these circumstances it would seem to be a reasonable possibility that large amounts of a patient's own gonadal androgens might have an effect on sperm production similar to that following direct injection of similar androgenic steroids.

DR. ALLAN KENYON, Chicago: I should like to ask Dr. Heckel whether he has had the experience of finding an increased number of sperm cells in the semen of hypogonadic patients who have been treated with this material. I at one time observed a decline in the sperm count of a eunuchoid from 1 to 2 per high power field on repeated examinations to none at all, which is entirely in agreement with the report of Dr. Heckel. However, the matter is not so simple as this because there have been reports of increased numbers of sperm cells in the semen of hypogonadic patients so treated. This apparent paradox is not without parallel in biologic investigations because it has been shown that the decrease in spermatogenesis after hypophysectomy in the rat may be prevented by testosterone, and it has been reported by the Cleveland group that even after post-hypophysectomy atrophy occurs large doses of this material may revive spermatogenesis, while in the normal immature rat the seminiferous epithelium is usually inhibited. There may be varying physiologic states in patients which modify this response. I should like to have Dr. Heckel's remarks on this point.

DR. N. J. HECKEL, Chicago: I believe that too much of this material is used for urologic diseases in which at present there is not enough evidence to justify its indication; for example, benign prostatic hypertrophy, impotence and sterility. The only indication for the use of this material in the treatment of undescended testes is a condition caused by a marked deficiency of male sex hormone, in which the testes cannot be influenced by stimulating therapy (the anterior pituitary-like principle), such as eunuchoidism, genital infantilism and hypogonadism. Concerning the question of whether the number of spermatozoa in those with hypogonadism can be increased, we have observed an increase, and it is possible to see how it might occur. However, one must realize that an increase or decrease of several million spermatozoa does not mean much, because there is an error of at least 10 per cent, possibly more, in the calculation.

Use of Desoxycorticosterone Acetate in Addison's Disease

DRS. E. PERRY McCULLAGH and E. J. RYAN, Cleveland: The basis of the report is six cases of Addison's disease proved by clinical or x-ray evidence alone, by occurrence of crises or typical abnormalities in sodium and chloride excretion. Treatment with desoxycorticosterone acetate has been carried on for periods of from six to ten months. Clinical benefit has followed the use of this substance in all cases. In two cases the use of the drug together with added sodium chloride and some restriction in potassium intake has resulted in complete symptomatic control. In two cases the symptoms have been much lessened but not completely alleviated, and in two cases in which treatment was less consistent or possibly inadequate, though improvement occurred, the results were only moderately good. In conjunction with other treatment, doses as large as 10 mg. or more a day were necessary before distinct initial improvement was obvious. In all cases weight gain occurred and the blood pressure rose. Blood pressure reached levels of hypertension in five. Plasma sodium and chlorides tend to rise, while high plasma potassium tends to fall, with desoxycorticosterone administration. These values are not always consistent with the clinical condition of the patient. Desoxycorticosterone causes the negative sodium and chloride balance of Addison's disease to revert to normal, and hemocentration is corrected by it. No change in pulse, temperature, pigmentation, or dextrose tolerance has been observed as a result of this substance. Arterial hypertension and massive edema may appear as evidences of overdosage. It has been observed that patients with Addison's disease may have arterial hypertension, as a result of the use of the drug, and yet not be free from symptoms of adrenal deficiency. Under such

circumstances, adequate doses of adrenal cortex extract may relieve these symptoms and withdrawal allow their recurrence. Withdrawal of desoxycorticosterone was associated in one case with outspoken symptoms of adrenal failure, while the blood pressure was maintained at levels much above pretreatment range. Desoxycorticosterone may cause a marked shift in chloride and water retention without a parallel improvement in symptoms, and, under the same circumstances, symptomatic benefit may follow the use of adequate doses of cortical extract without a further significant change in chloride or water balance. These observations are considered to be evidence of the fact that administration of desoxycorticosterone is not complete replacement therapy. It is advised that complete dependence should not be placed in this drug to the exclusion of the use of cortical extracts in the management of Addison's disease, especially when symptoms are incompletely controlled or in the presence of crises.

Treatment of Addison's Disease with Desoxycorticosterone Acetate

DRS. W. O. THOMPSON, PHEBE K. THOMPSON, S. G. TAYLOR III and W. S. HOFFMAN, Chicago: In our experience most reports on the efficacy of desoxycorticosterone acetate are overenthusiastic. We believe this state of affairs has been caused by (1) too short periods of observation and (2) combining the administration of synthetic material with that of sodium salts so that it is difficult or impossible to determine which produced the beneficial effects. The only real test of potency of any product in Addison's disease is its ability to substitute completely for the adrenal cortex without any other form of therapy. The natural history of Addison's disease with its spontaneous remissions and relapses is too often ignored in evaluating therapeutic agents. Observations must cover a long period of time. During a period of remission, a dose of adrenal cortex extract or of desoxycorticosterone may appear to be effective even though it is inadequate to prevent the periodic appearance of crises. We have been unable to confirm Thorn's observation that 1 mg. of desoxycorticosterone acetate is equivalent to 3 cc. of Wilson's adrenal cortex extract but find that 1 mg. is equal to less than 1 cc. of extract. In severe cases of the disease, 30 mg. daily is an inadequate dose when given as the only form of therapy. There appears to be some question as to whether it will substitute completely for the adrenal cortex. Two of our patients died suddenly while receiving the synthetic material, and in two foot drop developed during the course of treatment. At least another year and probably more will be required before the status of desoxycorticosterone acetate is precisely determined.

DISCUSSION

DR. E. J. KEPLER, Rochester, Minn.: I should like to reemphasize what Dr. Thompson has said. Treatment of Addison's disease is difficult to evaluate. A number of patients do well without any medical attention. I recently saw a patient who had had Addison's disease for at least five years. She had a fondness for table salt and had acquired the habit of eating a tablespoonful of salt daily. This patient sought medical advice largely because of the increasing pigmentation of the skin. Furthermore, there are two, and often three, variables to consider in the appraisal of therapeutic measures for Addison's disease, namely the intake of electrolytes, the effectiveness of replacement therapy and finally the extent and activity of tuberculosis in the body if the adrenal insufficiency (as is often the case) is the result of adrenal tuberculosis. Therefore when dealing with such a complicated problem one should be reluctant to accept conclusions based on short term observations, especially when some patients will get along well without any systematic treatment whatever. Our experience at the Mayo Clinic with desoxycorticosterone acetate has not been altogether satisfactory. Within a comparatively short time we have had five deaths, and there is reason to believe that desoxycorticosterone acetate was implicated in these deaths. This drug did not prevent crises from occurring in two of these five cases. In one case there is considerable evidence to suggest that the fatal outcome was the result of overtreatment. There is the possibility that as yet we have not learned to

use this drug to the best advantage. In any event, I do not believe that the drug should be used except by the experimental therapist. As far as the work of Dr. McCullagh is concerned, we have sufficient unpublished data to confirm what he has said concerning the capacity of desoxycorticosterone acetate to elevate the blood pressure, to cause retention of sodium and chloride and to produce edema.

DR. SAMUEL SOSKIN, Chicago: There can be no doubt that there is a difference in the effects of desoxycorticosterone and adrenal cortex extract. I think to clear the atmosphere it might be well to ask both authors this: How many patients with Addison's disease, whether treated with cortical extract or desoxycorticosterone with salt or without salt, have been treated for a period of a year and still survive at the present time?

DR. EDWARD RYNEARSON, Rochester, Minn.: Concerning the cases of crisis mentioned by Dr. Kepler, I may add that in two of them marked anasarca developed. In one case, autopsy disclosed 1,500 cc. of fluid in each thoracic cavity, marked abdominal ascites and generalized edema. One might say that this is not the right type of case; that this drug is intended for use in milder cases. One of our patients first came to us in 1913 at the age of 15 years with acute tuberculous peritonitis. She returned in 1934 with a four months history of Addison's disease. Treatment was prescribed, using 6 cc. of cortical extract a day with the addition of salt. In 1936 she entered in crisis, from which she was rescued. In 1939 the same thing occurred. During the interval she was in good health and could continue her normal activities. Sept. 11, 1939, 368 mg. of desoxycorticosterone acetate was implanted subcutaneously. She felt well and came back on October 10 for reexamination, which showed her condition to be satisfactory. Sixteen days later sore throat developed, but her condition was not grave. The following morning she was found unconscious with a temperature of 106 F. She was given cortical extract and brought to Rochester. She arrived at 6:30 p. m. and in spite of energetic treatment she died at 4:30 the following morning. I was present some years ago when Dr. Rowntree first administered cortical hormone to a patient with Addison's disease. I am sure many of you remember how encouraged we were for we felt that this hormone might prove as effective in the treatment of Addison's disease as insulin had proved in the treatment of diabetes mellitus. We have been greatly disappointed. Our hopes were again raised when the use of this new synthetic hormone was announced. Again we are disappointed.

DR. E. PERRY McCULLAGH, Cleveland: I cannot name offhand the number of patients who have gone for more than a year with or without treatment, but it is known that patients live a long time with Addison's disease without any particular treatment at all. One patient came to me with marked leukoderma, which was found to be due to Addison's disease. The leukoderma had existed for fourteen years before treatment for Addison's disease was started. I can agree with Dr. Thompson that we still do not have the ideal treatment of Addison's disease.

DR. W. O. THOMPSON, Chicago: The first patient to whom we administered adrenal cortex extract was first treated in February 1935. When first seen she weighed 75 pounds (34 Kg.) and she now weighs 125 pounds (57 Kg.). She does all her own housework and is but little handicapped by Addison's disease. Among our patients receiving cortical extract there have been three deaths but none in the last three years. We thought it was because of inadequate treatment that death ensued. We give enormous doses in crises and much larger doses than most observers for maintenance. In contrast to these results with cortical extract, two of five patients receiving desoxycorticosterone acetate in the past six months have died.

Low Plasma Potassium and Alkalosis of a Patient with Cushing's Syndrome

DRS. D. M. WILLSON, M. H. POWER and E. J. KEPLER, Rochester, Minn.: After simultaneous administration of potassium and ammonium chloride there was a marked positive potassium balance and the electrolyte pattern of the plasma

became normal. Later the administration of potassium citrate alone was followed by an increase in potassium but also by a decrease in the bicarbonate of the plasma, whereas administration of ammonium chloride was followed by a decrease in plasma potassium and, in turn, by a decrease in chloride and a trend toward alkalosis. The response to administration of these salts and the magnitude of the potassium retention in this case suggest that the potassium metabolism was at fault, possibly as the result of hyperfunction of the adrenal cortices.

DISCUSSION

DR. E. J. KEPLER, Rochester, Minn.: I should like to comment on the use of the term "Cushing's syndrome." A few years ago Kessel made the suggestion that the clinical features that Cushing had called attention to should be called Cushing's syndrome, regardless of etiology. He further suggested that cases of Cushing's syndrome that resulted from basophilic cell tumor of the pituitary should be called Cushing's disease. We have adopted that terminology in this paper. The history of the condition Dr. Willson presented is interesting. In 1932 Cushing published a description of pituitary basophilism in *THE JOURNAL*. At that time Dr. Frank Allen, who was then associated with the Mayo Clinic, and I had under observation a patient who had the clinical features that Cushing had just described. In addition this patient had severe diabetes. As a routine procedure we determined the carbon dioxide combining power of the blood and to our surprise found it abnormally high. This patient remained under observation for a number of months and ultimately died. During the course of the disease the carbon dioxide combining power continued at a high level and at one time was as high as 110 volumes per cent. None of the factors that ordinarily give rise to alkalosis, such as vomiting, diarrhea, ingestion of alkalis or hyperventilation, were present. That was the first case of Cushing's syndrome that we saw. We looked for other cases of this type. Of some thirty cases of adrenal tumor or Cushing's disease we have encountered only three have shown any abnormality of the electrolyte pattern of the blood. As to the significance of the data presented, I am not in a position to draw unequivocal conclusions. It appears that potassium is implicated in the production of the alkalosis and that potassium ions can correct the electrolyte pattern without changing the course of the disease. Whether or not this observation implies that the adrenal cortex is hyperfunctioning I do not know, but the recent studies that were presented at this meeting on the action of desoxycorticosterone acetate suggest that such may be the case.

DR. W. S. HOFFMAN, Chicago: A few years ago I made a survey of the potassium concentration in blood serum. At that time we seldom found wide deviations of the potassium concentration from the normal level of 18 to 22 mg. per hundred cubic centimeters. A drop to a value of 12 mg. per hundred cubic centimeters occurred only once, in a patient who had just been given an injection of epinephrine. Unfortunately at that time we had no cases of Addison's disease or Cushing's syndrome to study. Serum potassium levels as low as 10 to 11 mg. per hundred cubic centimeters in Cushing's syndrome seem unusual, but we can confirm these results by showing that patients with Addison's disease who have received an adequate amount of cortical therapy and salt frequently show such low potassium levels. In fact, such patients show an electrolyte pattern similar to that reported here for Cushing's syndrome. It is difficult to evaluate this low serum potassium concentration both in cases of Cushing's syndrome or in cases of adequately treated Addison's disease. It must be significant, but I doubt whether the change in potassium concentration is primary or that it in any way accounts for the symptoms found.

DR. E. J. KEPLER, Rochester, Minn.: I did not mean to imply that the behavior of potassium was responsible in any manner for the major symptoms of Cushing's syndrome. It has nothing to do with the disturbances of the sexual characteristics. There are three essentials in the chemical picture that has been described: a low concentration of plasma potassium, a low concentration of plasma chlorides and high carbon dioxide combining power. Which of these essentials is the

primary factor is difficult to determine. The features are not exactly what one might expect to result from a hyperfunctioning adrenal cortical lesion, since low values for the plasma chlorides also occur with considerable regularity in cases of adrenal insufficiency.

Pancreatic Secretion Following Stimulation with Secretin and Acetyl-Beta-Methylcholine Chloride (Mecholyl Chloride)

MANDRED W. COMFORT, M.D., and ARNOLD E. OSTERBERG, PH.D., Rochester, Minn.: The volume of duodenal content, the hydrogen ion concentration of duodenal content and enzymatic values have been determined in work with thirteen normal persons both before and after stimulation of pancreatic secretion with secretin and acetyl-beta-methylcholine chloride (mecholyl chloride). Secretin and mecholyl chloride produced contrasting effects on pancreatic secretion. Secretin produced a large volume of pancreatic juice, increased the hydrogen ion concentration and total quantity of enzymes excreted but produced a prolonged reduction in the concentration of enzymes. Mecholyl chloride, on the other hand, increased the volume of pancreatic juice only slightly, did not appreciably affect the hydrogen ion concentration but did provoke prolonged increase in the concentration of enzymes and increased the total output of enzymes. Secretin and mecholyl chloride are satisfactory agents for the clinical study of the humeral and nervous mechanisms controlling the pancreatic secretion of man.

DISCUSSION

DR. ANDREW C. IVY, Chicago: This is obviously a good piece of work. I desire to make two suggestions for the discussion: the first is to mention what is known about the psychic secretion of pancreatic juice, and the second is to discuss the possible usefulness of secretin. When the psychic secretion of gastric juice is collected from a dog, from 30 to 60 cc. is obtained. When a human being is sham fed, from 100 to 200 cc. of gastric juice is collected. The juice collected after sham feeding is more concentrated in enzymes than the juice obtained after the injection of histamine. In the case of the pancreas, when a dog with a pancreatic fistula is sham fed, from 3 to 7 cc. of pancreatic juice is obtained, a relatively small amount. I mention that because I doubt whether the nervous secretion of pancreatic juice is very important and because sham feeding is more of a physiologic stimulus than pilocarpine or mecholyl. As far as I know, the effect of sham feeding on pancreatic secretion of the human being has not been determined. The pancreatic juice one obtains from sham feeding is rich in enzymes, but the total output of enzymes does not amount to much. I picture the effect of the vagus nerve on pancreatic secretion when we eat a meal in this way: Vagal impulse affects the zymogen granules in the cell in such a way as to facilitate their solution; then secretin acts to wash these more soluble zymogen products out of the cell. In a normal pancreatic response to a meal both the nervous and the secretin effect operate. What about the usefulness of secretin? Several years ago, when we injected secretin into twenty-six normal medical students, there were three subjects who put out a relatively small total quantity of enzymes. We suspected in them a pancreatic deficiency, so we fed those students a modified Schmitt diet containing 250 Gm. of rare beef tenderloin and 60 cc. of olive oil. We found meat fibers and oil in the stools of all three subjects. The analysis of the stools gave us as much information then as the use of secretin. However, I believe secretin will be used in the diagnosis of absolute pancreatic insufficiency in the same way that histamine is used for such a diagnosis in the case of the stomach at present. The use of secretin may also demonstrate that one enzyme is deficient whereas the others are adequately secreted.

Necrobiosis Lipoidica Diabeticorum

DRS. ALICE HILDEBRAND, HAMILTON MONTGOMERY and E. H. RYNEARSON, Rochester, Minn.: The clinical, pathologic and biochemical observations made in sixty-four cases of necrobiosis lipoidica diabeticorum reported in the literature were reviewed and similar studies made in seven cases seen at the Mayo Clinic were summarized.

Desiccated Hog's Stomach Extract (Ventriculin) in the Treatment of Atrophic Gastritis

DRS. LEON SCHIFF and SANDER GOODMAN, Cincinnati: Five patients with a gastroscopic diagnosis of chronic atrophic gastritis not associated with other gastric disease, anemia, protein deficiency or obvious vitamin deficiency were given desiccated hog's stomach extract (ventriculin) in doses averaging from 30 to 60 Gm. a day. Marked symptomatic improvement occurred and was usually associated with disappearance of the atrophic changes. When the administration of ventriculin was stopped there was usually a return of the gastric changes which was usually associated with a return of symptoms. These observations suggest that atrophic gastritis may be due to a deficiency of a substance contained in desiccated hog's stomach extract.

DISCUSSION

DR. RUDOLF SCHINDLER, Chicago: This presentation is important because atrophic gastritis is a serious disease not only because of its connection with pernicious anemia and carcinoma but because of its own symptoms, such as weakness and fatigue, which require treatment. Probably not every case of atrophic gastritis is the result of a deficiency. I believe that chronic superficial gastritis may precede formation of a purely inflammatory atrophic gastritis, and it remains doubtful whether they will respond to any treatment. Drs. Palmer and Kirsner and I were able to watch carefully eight cases, and in three the condition did not respond to liver, iron or vitamin therapy. In four cases the gastric mucosa became normal. When the treatment was interrupted, the atrophy returned in two cases. We do not know whether regeneration of gastric mucosa takes place or whether some elements are lacking. Our results are not quite as good as those of Dr. Schiff. It may be that the concentrated liver extract we use is not as potent as the ventriculin. It is worth while to try to treat this disease with substitution therapy, using iron or liver, vitamin or ventriculin.

DR. CLARENCE F. G. BROWN, Chicago: I should like to ask if the authors used gastric mucin in their controls.

DR. E. A. SHARP, Detroit: I believe that the evidence accumulated to show that there is deprivation of some factor may reflect on the lack of information about desiccated hog's stomach. It is known to contain small amounts of vitamin B₂, varying from entire absence to 20 Sherman units per gram. Occasionally this is more concentrated, and sometimes it is absent. Therefore it should be known whether vitamin B₂ was present in the product used and in what amount. With the implication that this deprivation occurs in achlorhydric anemia and that recovery of the mucosa is associated with the administration of ventriculin, I believe further evidence of therapeutic benefit should be accumulated by Dr. Schiff's method and further work should be done on stomach tissue to determine if there is a factor present that we have not considered.

DR. LEON SCHIFF, Cincinnati: We did not use gastric mucin. As to the case in which hydrochloric acid returned, you may recall that this happened a year after treatment was stopped and that the patient failed to relapse after withdrawal of ventriculin. It is therefore possible that the return of hydrochloric acid may have been coincidental. We have naturally been interested in the vitamin content of ventriculin and hope to continue this phase of the problem.

Icterus Complicating Lobar Pneumonia in the Negro

DRS. EDWARD L. TURNER, MICHAEL J. BENT, GUERNEY D. HOLLOWAY and JOHN R. CUFF, Nashville, Tenn.: In a further effort to determine the etiology of icterus in lobar pneumonia and to explain, if possible, the cause of the higher incidence of this complication in Negro patients as compared with white patients, the authors attempted to reproduce and extend Maugeri's experiments. In accord with his studies, rabbits were used as the experimental animal. Insufflations of autogenous blood into the lungs of rabbits produced detectable icterus in only a few of the animals, partially supporting Maugeri's claims. When pneumococci virulent for the rabbit were insufflated into the trachea the animals were overwhelmed too rapidly to produce a picture of pneumonia simulating the human disease. Filtrates of pneumococcus broth cultures combined with autogenous blood when insufflated into the lungs produced tissue

changes in the lungs and liver similar to those seen in human lobar pneumonia. This combination, however, failed in most instances to produce a detectable icterus until after experimental impairment of the liver function.

DISCUSSION

DR. ARTHUR A. HOLBROOK, Milwaukee: Reference was made to Eppinger's observations in this condition. In 1938 I had occasion to visit his clinic. One day on ward rounds he presented a case of lobar pneumonia complicated by jaundice. He pointed out that it was his impression that this complicating factor occurred more frequently when the lobar involvement was in the right lower lobe. I should like to ask if any correlation has been made between lobar distribution and the complicating factor of jaundice.

DR. EDWARD L. TURNER, Nashville, Tenn.: We attempted to correlate the lobar distribution and the complicating factor of jaundice and were unable to do so.

Treatment of Amebiasis by a Combined Method (Oral Administration of Carbarsone and Retention Enemas of Chiniofon)

DRS. JOHN G. MATEER, JAMES I. BALTZ, DONALD F. MARION and ROBERT A. HOLLANDS, Detroit: No single known drug, when used alone in treating amebiasis, has yielded more than about 90 per cent permanent cures with a single course of therapy. A group of 104 patients, some with acute involvement and others carriers, have received only one course of combined treatment, consisting of carbarsone by mouth and simultaneous chiniofon retention enemas given according to a special technic. After treatment careful and repeated stool examinations were made in every case over a period varying from six months to three and one-half years; 97 per cent of these patients remained persistently free from amebas. In no case was there any unfavorable drug reaction.

DISCUSSION

DR. ARTHUR J. ATKINSON, Chicago: How large was the cleansing enema and why did you combine oral and enema treatment instead of giving both drugs orally, since most cases of amebiasis begin in the terminal ileum? Perhaps I have been overcautious about using enemas in amebic dysentery, having seen perforation occur after an enema. Some observers have reported perforation after proctoscopic examination.

DR. JOHN G. MATEER, Detroit: The size of the preliminary saline enema was about 750 cc. We are careful not to overdistend the bowel. The complication referred to by Dr. Atkinson has not been seen in our experience. As regards giving these two drugs simultaneously by mouth, this could probably be done, but I do not know whether it would give as high a percentage of successful end results. I think there is an advantage in getting the concentrated chiniofon solution into intimate contact with the mucous membrane of the large bowel, rather than having the drug diluted and mixed with much fecal material.

Intravital Staining of Malignant Neoplasms by Evans Blue

DRS. ALEXANDER BRUNSCHWIG and T. HOWARD CLARKE. (Introduced by DR. WALTER L. PALMER), Chicago. Evans blue, a nontoxic electronegative azo dye, an isomer of trypan blue, used in blood volume determinations, was injected intravenously into twenty patients with various forms of malignant neoplastic disease. While the dye stained all tissues diffusely in the doses employed, there was in thirteen of the twenty patients selective concentration of the dye in and about the malignant neoplastic foci.

DISCUSSION

DR. CLARENCE BERNSTEIN, Chicago: Several of these pictures resembled those seen in studies of intravital staining with trypan blue and other similar dyes in which the dye was found to be in the lymphatic capillaries. Was the dye in these tumors found to be localized in lymphatics obstructed by the neoplastic tissue?

DR. ALEXANDER BRUNSCHWIG, Chicago: When seen in and about the neoplastic foci the dye is in the macrophages and fibroblasts of the connective tissue in these areas. The dye does not accumulate in the neoplastic cells themselves.

Current Medical Literature

AMERICAN

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American Heart Journal, St. Louis

- 18: 647-788 (Dec.) 1939
- Speed of Healing of Myocardial Infarction: Study of Pathologic Anatomy in Seventy-Two Cases. G. K. Mallory, P. D. White, Boston, and J. Salcedo-Salgar, Bogota, Colombia.—p. 647.
 - Combined Syphilitic Aortitis and Rheumatic Disease of Heart: Report of Four Cases. H. Swanson, Nashville, Tenn.—p. 672.
 - Earliest Correlation of Clinical and Experimental Auricular Fibrillation. M. Block, Ann Arbor, Mich.—p. 684.
 - *The Electrocardiogram in the Aged: Study of 100 Men and Women Over the Age of 70 with Apparently Normal Hearts. G. Levitt, St. Paul.—p. 692.
 - Nicotinic Acid: Its Action on Peripheral Vascular System. R. J. Popkin, Los Angeles.—p. 697.
 - *Incidence of Organic Heart Disease in School Children. Louise W. Rauh, Cincinnati.—p. 705.
 - Comparative Study of Precordial Leads IV R and IV F. A. J. Geiger, New Haven, Conn.—p. 715.
 - Roentgenkymography of Heart: Its Clinical Applications and Limitations. R. Gulner, J. H. Crawford, W. A. Smith and H. E. Unger, New York.—p. 729.
 - Coronary Embolism: Report of Three Cases. C. F. Garvin and J. L. Work, Cleveland.—p. 747.

Electrocardiograms of the Aged.—From the general

medical clinic of the University of Minnesota Levitt chose 100 patients (from 71 to 93 years of age) with no evident disease of the cardiovascular-renal system, with the exception of the usual changes in the palpable vessels, after a careful physical examination. A painstaking history also elicited no symptoms of cardiovascular-renal disease. The subjects selected were able to perform such tasks as walking two miles, washing clothes, running a household or performing regular duties of a manual nature without dyspnea. None had attacks of nocturnal dyspnea. All patients stated that they were leading an active life, but at a slowed tempo. The complaints of more than 90 per cent of them were prostatic symptoms, carcinoma of the skin, chronic arthritis or diseases of the eye. Sixty-four were men and thirty-six were women. The electrocardiograms of all of them (based on a criteria of RT or ST segment elevated or depressed more than 1 mm. in relation to the iso-electric line, T waves diphasic, longer than 0.1 second, presence of a Pardee Q₂) showed that the hearts of twenty-six, sixteen men and ten women, were abnormal, according to the foregoing criteria of abnormality. Twenty-three of the remaining seventy-four patients had premature beats. Left axis deviation was present in fifty-nine and right axis deviation in two. Changes in the ventricular complex are not always identified with a diseased myocardium, and in the presence of severe cardiac muscle damage. Consequently the author states that the pronounced changes found in 26 per cent of his patients should be interpreted with the fact in mind that in rare instances the electrocardiogram is at variance with demonstrable cardiac lesions. He points out that there is sufficient evidence that changes in the electrocardiogram take place normally in the aging heart. These changes include a tendency to decline, for the T wave to be lowered and toward an increase in the duration of the QRS and PR intervals. These moderate changes in the electrocardiogram may or may not indicate that cardiac lesions are present. The author does not regard the alterations of his twenty-six patients simply as a part of the process of senescence. It is believed that they represent some abnormality of the heart.

Organic Heart Disease in School Children.—Rauh reports the incidence of organic heart disease in 85,389 children attending 157 Cincinnati schools. These children were examined

by school physicians, and 1,782 of them had some clinical suggestion of heart disease. When this group was reexamined by four pediatricians (especially interested in cardiology) 633 were found to have normal hearts, 700 to have murmurs which were believed to be only functional or accidental in type and 449 to have definite evidence of heart disease. This last group constituted 25.4 per cent of the patients selected by the school physicians, or 0.53 per cent of the entire number of children. Of the 449 children with heart disease 304 had definite evidence of organic lesions, 109 were classified as possibly having organic disease but requiring further observation to complete the diagnosis and forty-one had extrasystoles. Of the 304 children with organic lesions, a diagnosis of acquired heart disease, probably rheumatic in origin, was made in 55 per cent and congenital lesions in 45 per cent. Acquired heart disease was more prevalent in the Negro than in the white children. It occurred more frequently in girls than in boys, and more often in children living under poorer economic conditions. The incidence of congenital heart disease was independent of race or sex and was fairly equally distributed among the different age groups studied. A comparison of the results of this study with previous school surveys indicates that there are wide variations of incidence in different localities. The statement that 80 per cent of the acquired lesions are rheumatic in origin is true only in areas in which rheumatic fever is prevalent and severe and cannot be universally employed as a distribution figure.

American Journal of Public Health, New York

- 29: 1283-1380 (Dec.) 1939
- Health for Three Thirds of the Nation. E. S. Godfrey Jr., Albany, N. Y.—p. 1283.
 - Public Health Aspects of Federal Food, Drug and Cosmetic Act. W. S. Frisbie, Washington, D. C.—p. 1292.
 - Aspects of Governmental Policy on Stream Pollution Abatement. H. G. Baity, Chapel Hill, N. C.—p. 1297.
 - Some Essentials in Training for Public Health. A. Gregg, New York.—p. 1308.
 - The Trained Worker Goes to Work. W. P. Shepard, San Francisco.—p. 1313.
 - *Development of Tuberculosis in Infected Children. A. S. Pope, P. E. Sartwell and D. Zacks, Boston.—p. 1318.
 - *Food Poisoning Due to Staphylococci, with Special Reference to Staphylococcus Agglutination by Normal Horse Serum. G. G. Slocum and B. A. Linden, Washington, D. C.—p. 1326.
 - Prenatal and Prenatal Tests for Syphilis in New Jersey. J. Hall, Trenton, N. J.—p. 1331.
 - Advances in Thiamin Research. A. Arnold, F. D. Baird, Harrison, N. J., and C. A. Elvehjem, Madison, Wis.—p. 1344.

Development of Tuberculosis in Infected Children.—

The data that Pope and his associates present were based on the tuberculin tests of 400,000 school children in the Chadwick Clinics between 1924 and 1934, the reexamination of certain groups of these children and the cases of pulmonary tuberculosis subsequently reported in the entire group. The subsequent reported morbidity and mortality from tuberculosis has been determined to the end of 1936 and rates have been computed on the basis of the original reaction. Among the reactors the morbidity from the adult type of tuberculosis has been about four times that in the nonreactors. The death rate has been three times as great in the reactors, and the case fatality essentially the same in the two groups. The cumulative morbidity from tuberculosis in children reexamined annually for from ten to eleven years was more than 6 per cent. This rate was approximately twice as high in girls as in boys and was substantially higher among reactors than among nonreactors. Among reactors it was more than three times as high in those with originally positive roentgenograms. The tuberculosis morbidity among children with a history of a family exposure to the disease was two and a half times that in children without known exposure. Age specific morbidity rates in the series show that significant tuberculosis is infrequent in school children less than 10 years of age and that the incidence rises rapidly after this age, much more rapidly in girls than in boys.

Food Poisoning Due to Staphylococci.—Slocum and Linden discuss the occurrence of twenty outbreaks of food poisoning apparently due to staphylococci, all of which followed the consumption of "ready to eat" hams or tongue. In these twenty outbreaks at least 1,028 individuals were affected. Two deaths occurred, neither of which was attributed directly to food poisoning but to other complicating conditions. In many of the outbreaks there is little evidence to indicate the source of

the staphylococci or when, in the process of manufacture, distribution and handling prior to consumption, the organisms entered the products. The public health problem presented by the staphylococcus food poisoning, incriminating "ready to eat" ham and related salt-cured meat products, appears to be as great as that presented by custard bakery products. A study of thirty-seven strains of staphylococci isolated from food involved in eleven outbreaks demonstrated that the majority of the strains had lost their ability to produce enterotoxin and a positive Stone reaction during storage on laboratory mediums. A fundamental difference between the enterotoxic and nonenterotoxic strains studied seems to be indicated by the fact that they differ markedly in agglutinability by normal horse serum.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

42: 797-950 (Dec.) 1939

- *Prepyloric Ulcer and Carcinoma.* D. A. Sampson and M. C. Sosman, Boston.—p. 797.
- Clinical Study of Reactions Following Employment of Pitressin in Cholecystography.* B. R. Kirklin and E. E. Seedorf, Rochester, Minn.—p. 811.
- Reticulo-Endothelial Neoplasia.* R. Paterson and Margaret C. Tod, Manchester, England.—p. 820.
- Metastatic Pulmonary Infiltrations of Inflammatory Origin.* A. J. Ackermann, Oklahoma City.—p. 828.
- Metastases from Carcinoma of Tongue.* M. D. Sachs, Portland, Ore.—p. 833.
- Spontaneous Amputation of Tongue: Case Report.* S. Richman, New York.—p. 843.
- Roentgen Pelvimetry: Simplified Method.* E. G. Reuter, Portland, Ore., and R. J. Reeves, Durham, N. C.—p. 847.
- *Present Status of Roentgen Treatment of Sinus Infections.* W. B. Firor and C. A. Waters, Baltimore.—p. 857.
- Deep Roentgen Ray Therapy of Mammary Carcinoma: III. Fifteen Year Results in a Formerly Published Group and Statistical Analysis of 1,200 Cases Treated Between 1922 and 1937.* W. A. Evans and T. Leucutt, Detroit.—p. 866.
- Fracture of Neck of Femur Complicating Roentgen Therapy of Ovarian Cancer.* Clara L. Okrainetz and S. B. Biller, New York.—p. 883.
- *Radium Therapy in Hodgkin's Disease: Report of Case.* C. Sayago, Santiago, Chile.—p. 888.
- Malignant Tumors of Tongue: Modified Method of Treatment.* von Dollinger da Graça, Rio de Janeiro, Brazil.—p. 890.
- Vascularization of Brown-Pearce Rabbit Epithelioma Transplant as Seen in Transparent Ear Chamber.* A. G. Ide, N. H. Baker and S. L. Warren, Rochester, N. Y.—p. 891.

Roentgen Treatment of Sinus Infections.—To determine which type of sinusitis is amenable to roentgen therapy, Firor and Waters adopt a classification which has as its basis the various microscopic changes observed in the different stages of the infection. 1. Most cases of acute sinusitis clear up under the usual treatment of inhalations, packing, suction and washings. Because of this, as well as the tension in the affected sinus, roentgen treatment is not indicated. After good drainage has been established, one or two small roentgen doses may hasten convalescence. 2. In subacute sinusitis when examined roentgenologically after washing, the antrums are observed to have extremely thick membranes enclosing a small air space. Unless treated by radical operation or irradiation, they often become chronically infected. The membrane, being filled with lymphocytes and a smaller number of polymorphonuclears, is markedly sensitive to the rays. 3. Cases of chronic sinusitis with thickened membrane, but without polyp formation, are usually due to failure to consult a rhinologist early enough. Others have not been adequately treated or have resisted the usual forms of treatment. This type of sinusitis is also definitely sensitive, being only slightly less so than the subacute group. Microscopic section shows dense infiltration of the submucous area by large numbers of lymphocytes and a moderate number of polymorphonuclear and plasma cells. A favorable reaction to irradiation can be expected because of the cellular infiltration of the submucosa. 4. Chronic sinusitis with much scar tissue or polyp formation constitutes a later developmental type in the course of sinus disease. Because of the presence of scar tissue and relatively little cellular infiltration this group is less sensitive than the preceding, although early scar tissue and polyp formation may be affected moderately by fractional highly filtered radiation, whereas later fibrosis and polyposis is affected but slightly if at all. Microscopic section shows fibrosis with relatively little leukocytic infiltration. 5. Atrophic sinusitis is resistant to the rays. Allergic cases of sinusitis are unlikely to respond to irradiation unless there is associated infection. Lymphoid hyperplasia in the nasopharynx in children in association with thickened sinus membranes responds exceedingly well under

irradiation. Good drainage in subacute infections and open ostiums in the chronic group are most desirable. The removal of infected tonsils and adenoids, submucous resections and nasal polypectomies have been found to be of primary importance for permanent relief of this distressing condition. Irradiation is worthy of trial in these difficult cases because many of the sinus membranes contain lymphocytes on microscopic examination. The authors believe that about 70 per cent of properly selected cases of sinusitis can be cured (complete disappearance of symptoms with clear sinuses) or markedly improved (complete disappearance of symptoms with slightly opaque sinuses) by irradiation. The use of prolonged and intensive therapy is not necessary. The authors have had excellent results after four biweekly doses of 100 roentgens each. At times it has been necessary to use 600 roentgens over a period of three weeks to obtain the maximal desirable result. This dose, delivered at 125 kilovolts, 5 milliamperes, 35 cm. focal skin distance and filtered through 4 mm. of aluminum, is about 45 per cent of an erythema dose under these circumstances. Epilation is prevented by covering the hair, eyebrows and eyelashes with strips of lead. In children the dental buds in the maxilla are similarly protected. Fractional doses give the operator better control, tend to avoid possible unpleasant sequelae, such as headache, and will permit the administration of a larger dose should this be necessary.

Radium Therapy in Hodgkin's Disease.—Sayago reports a case of Hodgkin's disease which demonstrates that small quantities of radium, not more than 160 mg., at a distance of from 6 to 7 cm. from the surface of the skin, is enough to produce satisfactory results even in cases in which there are enlarged lymph nodes deep in the chest. The low intensity of radium compared with roentgen radiation is a disadvantage in this application, as the distance to the skin cannot be increased very much unless large quantities of radium are used. In this case a skin distance of not more than 6 cm. was sufficient to cause large nodes situated within the chest to disappear. The nodes within the chest were irradiated through two skin ports, one over the cervical region and the other over the anterior part of the chest. Notwithstanding the great distance from the cervical region to the lower nodes within the chest there was a marked diminution in size before the second application was made.

American Journal of Surgery, New York

47: 1-260 (Jan.) 1940

- Postoperative Wound Disruption and Evisceration: Analysis of Thirty-Four Cases with Review of Literature.* A. Bowen, Los Angeles.—p. 3.
- Superiority of Very Fine Catgut in Gastrointestinal Surgery.* J. O. Bower, J. C. Burns and H. A. Mengle, Philadelphia.—p. 20.
- Simplification of Physick-Frank-Sellheim Principle of Extraperitoneal Cesarean Section.* J. V. Ricci, New York.—p. 33.
- Modification in Repair of Complete Laceration of Pelvic Floor.* G. L. Moench, New York.—p. 41.
- Use of Fascia Lata in Vaginal Surgery.* H. Kirschbaum, Detroit.—p. 42.
- *Endocrines and Spermatogenesis.* R. S. Hotchkiss, New York.—p. 45.
- Radiation Treatment of Cancer of Breast.* E. Uhlmann, Chicago.—p. 51.
- External Lateral Dislocation of Elbow.* W. D. Griesemer, Reading, Pa.—p. 57.
- Treatment of Shoulder Dislocations.* R. L. Peterson, Glasgow, Mont.—p. 71.
- Analysis of Results Following Sympathectomy for Peripheral Vascular Disease.* G. de Takats, Chicago.—p. 78.
- Surgical Treatment of Carcinoma of Pancreas.* G. Crile Jr., Cleveland.—p. 87.
- Sarcomas of Small Intestine.* A. B. Ragins and F. L. Shively Jr., Chicago.—p. 96.
- Immediate Surgical versus Expectant Medical Treatment of Clinically Acute Gallbladder Disease.* A. Strelinger, Elizabeth, N. J.—p. 105.
- *Ammonium Bicarbonate Secreted by Surgical Maggots Stimulates Healing in Purulent Wounds.* W. Robinson, Washington, D. C.—p. 111.

Endocrines and Spermatogenesis.—Hotchkiss states that there is evidence of the close relationship of spermatogenesis and the gonadotropic hormones. Appropriate use of gonadotropic substance can cause hyperplasia and hypertrophy of testicular cells in hypophysectomized animals which appear to be closely related to the onset of spermatogenesis in seasonal breeders. Certain seminal deficiencies may be the result of minor infractions of the endocrines, particularly the pituitary. The author has on record several well controlled cases which

have demonstrated gradual but progressive increases in sperm counts following prolonged use of gonadotropic substance. Three cases are presented illustrating improvement coincidental to the use of the gonadotropic principle.

Ammonium Bicarbonate in Wound Healing.—In a further analysis of the secretions of surgical maggots, Robinson found that ammonium bicarbonate is present in comparatively large quantities. In solution ammonium bicarbonate has an alkalinity of pH 7.7, corresponding roughly with that of maggot excretions. Wounds treated with maggots tend to have this same alkalinity. Preliminary tests were made with commercial ammonium bicarbonate to determine what effect the pure solution would have when applied to wounds of dogs and rabbits having persistent discharging sores, chiefly on the back and legs. A 2 per cent solution of ammonium carbonate or bicarbonate in sterile water was made up and applied to the wounds in a series of comparative tests. The wounds were thoroughly moistened several times a day with either of these solutions. The wounds healed with the formation of little scar tissue. In later studies with gauze packs saturated with 1 or 2 per cent concentrations of either of the two ammonium compounds, healing was promoted in purulent and indolent wounds. In purulent conditions, such as chronic osteomyelitis, diabetic and varicose ulcers, otitis media and infected lacerations, ammonium bicarbonate solution caused an improvement in the wound similar to that produced by maggots.

American Journal of Tropical Medicine, Baltimore

19: 497-614 (Nov.) 1939. Partial Index

- *Clinical Studies in Nondysenteric Intestinal Amebiasis. J. J. Sapero, Panama, Republic of Panama.—p. 497.
Incidence of Human Intestinal Parasite Infections Among Patients in State Institution of Indiana. J. M. Kmezza, Lafayette, Ind.—p. 515.
Effect of Mouse Passage on Cultural Characteristics and Virulence for Mice of Organisms Causing Blastomycosis. R. D. Baker, Durham, N. C.—p. 547.
Dog as a Natural Host for Histoplasma Capsulatum: Report of Case of Histoplasmosis in This Animal. W. A. De Monbreun, assisted by Katherine Anderson, Nashville, Tenn.—p. 565.
Susceptibility of Anopheles Quadrimaculatus to Plasmodium Vivax After Prolonged Insectary Cultivation. M. F. Boyd, Tallahassee, Fla.—p. 593.

Nondysenteric Intestinal Amebiasis.—Sapero investigated only patients with intestinal amebiasis who gave neither a present nor a past history of dysentery. The cases comprised both symptomless carriers of *Endamoeba histolytica* and infected individuals with complaints of varying severity. Control observations were made whenever feasible. Only those symptoms and signs were ascribed to *Endamoeba histolytica* after other possible causes had been ruled out. In all, 216 cases of nondysenteric amebiasis were studied, of which 100 were found to show symptoms. A study of the symptomatology of 106 apparently healthy men harboring *Endamoeba histolytica* showed forty-six, or 43.4 per cent, to have symptoms. A control group of 108 cases negative for intestinal protozoa revealed only eight, or 7.4 per cent, to have complaints. Of the 106 men harboring *Endamoeba histolytica* only 13.2 per cent had complaints of any appreciable severity. Of 236 individuals harboring various intestinal protozoal species, but not *Endamoeba histolytica*, the percentage with symptoms was similar to that found in the nonparasitized group, with the exception of *Diendamoeba fragilis*, as 27.3 per cent of forty-four persons presented symptoms. A study of the blood of sixty-one apparently healthy carriers of *Endamoeba histolytica* showed no significant differences from the results obtained in a control group of an equal number of individuals not harboring the parasite. Despite the apparent trivial nature of the complaints of the ambulatory group of patients a study of various hospitalized groups showed that a considerable number of nondysenteric amebic infections are severe enough to require hospitalization. In forty-seven such cases the condition was so obscure that only the finding of the parasite in the stool led to the proper diagnosis, and in these specific antiamebic treatment gave good results where other methods had failed. The complaints were primarily referable to the gastrointestinal tract, yet without blood and mucus in the stools and usually without intestinal abnormalities which might suggest an amebic process. Complaints referable to both the upper and the lower gastrointestinal tract appeared with equal frequency. Com-

plaints referable to other systems were seldom encountered. Chronicity, recurrence and mildness of the symptoms were characteristic features. A symptom complex simulating subacute or chronic appendicitis was the most commonly observed syndrome in this series of nondysenteric cases of amebiasis.

American Review of Tuberculosis, New York

40: 607-754 (Dec.) 1939

- Tuberculin Test: Its Value and Its Limitations. E. R. Long, Philadelphia.—p. 607.
X-Ray Findings in Tuberculin Reactors and Nonreactors. B. H. Douglas, Detroit.—p. 621.
Tuberculin Test in Control of Tuberculosis. J. A. Doull, Cleveland.—p. 634.
Tuberculin and X-Ray Survey: Observations in Giles County, Tennessee. W. P. Dearing, Montgomery, Ala.—p. 640.
Mass Tuberculin Testing and X-Raying. C. L. Ianne, San Jose, Calif.—p. 654.
Fluoroscopy in Case Finding. J. Rodriguez Pastor, San Juan, Puerto Rico.—p. 657.
*Fateful Periods in Life of Tuberculosis-Infected Individual. J. Holló.—p. 659.
Hematogenic Tuberculosis in the Adult: II. Hematogenic Pulmonary Tuberculosis. E. H. Rubin, New York.—p. 667.
*Basal Tuberculosis. L. F. Busby, Northville, Mich.—p. 692.
Unexpandable Lung: I. Statement of Problem. J. E. Farber and N. S. Lincoln, Mount Morris, N. Y.—p. 704.
Id.: II. Case Reports. J. E. Farber and N. S. Lincoln, Mount Morris, N. Y.—p. 710.
Closed Intrapleural Pneumonolysis. H. A. Jones, Tranquille, B. C.—p. 722.
Pleural Sensitivity to Procaine. K. M. Soderstrom, Seattle.—p. 733.

Fateful Periods of Tuberculosis-Infected Individual.—Holló maintains that the fate of the tuberculous individual depends largely on his behavior during certain, usually short, periods of life. Under physiologic conditions, infection with tuberculosis as a rule does not involve serious danger. If, however, resistance is broken by some additional factor infection will progress. In most cases the tuberculosis is the effect of certain factors besides the infection. Malnutrition, overexertion and lack of pure air are the chief catalysts of tuberculosis, to which one may add the lack of hygienic culture, especially in groups living in an infected environment. In the years around the Great War the start of tuberculous disease could but occasionally be traced to some well defined indiscretion in life habits. Now the connection between some harmful influence and the apparent start of the disease is obvious in most cases. Among the events which in the author's experience have given rise to manifest disease or to an exacerbation of a quiescent condition are college examinations, military service, training for athletic competition, mountain climbing, camping, excessive sunbaths, overwork, exhaustion, nursing of a gravely ill parent, love affairs, abortion, childbirths in quick succession, divorce, death in the family, weight reducing cure, tonsillectomy, drastic antisyphilitic treatment and intercurrent diseases. Infancy and senility rather than puberty represent the most susceptible periods for tuberculosis.

Basal Tuberculosis.—Busby says that a review of the literature shows that the outlook for basal tuberculosis is unfavorable. He found that among 3,597 new patients admitted to the Detroit Municipal Tuberculosis Sanatorium 795 were children. Among the adults the lower lobes were involved in 1.8 per cent, while among the children the incidence was about 20 per cent. The adult cases form the basis of the present study. The duration of symptoms before diagnosis or hospitalization in the adult cases varied from two weeks to several years. Although the average duration of symptoms was 5.5 months, the disease of forty was moderately or far advanced, thirty-one had cavitation varying from 1 to 9.5 cm. in diameter and twenty-two showed evidence of spread to the contralateral lung. The time of spread varied from three months to two years, but in the majority it was between three and six months. From a comparison of basal with initial disease in the upper half of the lung in an equal and comparable number of persons, the disease of twenty-two of the former and twelve of the latter spread to the same or to the contralateral lung. From this it appears that basal lesions tend to early and rather large cavity formation and to earlier and more frequent spread than initial lesions in the upper half of the lung. The results in five cases treated with bedrest alone indicate that this therapy is not safe or justified for basal lesions. Six of the eleven patients with moderately advanced involvement who received phrenic surgery alone recovered, while three of eight who received

artificial pneumothorax alone recovered. This suggests that in minimal and moderately advanced involvement crushing of the phrenic nerve might be tried before artificial pneumothorax is induced. In the far advanced cases no benefit was derived from phrenic nerve surgery alone. Of the twenty-two patients receiving pneumothorax alone six recovered, while of the twenty-eight who received both pneumothorax and phrenic surgery twenty-one recovered. This suggests that in far advanced cases artificial pneumothorax should be attempted first with a view to adding phrenic surgery relatively soon. The difference in favorable results warrants the use of both procedures whenever possible. The author states that patients with disease of the lower lobes, when adequately treated, behave much the same as patients with disease elsewhere in the lung.

Annals of Internal Medicine, Lancaster, Pa.

13: 915-1104 (Dec.) 1939

- Epidemic Influenza: Studies in Clinical Epidemiology. T. Francis Jr., New York.—p. 915.
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 *Influence of Vitamin Deficiencies on Other Diseases. J. B. Youmans, Nashville, Tenn.—p. 980.
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 *Picrotoxin in Treatment of Acute Barbiturate Poisoning: Review of Literature with Report of Two Cases. E. C. Reifenstein Jr. and E. C. Reifenstein Sr., Syracuse, N. Y.; with collaboration of J. W. Mignault, Baldwinsville, N. Y., and A. J. Raffaele, Syracuse, N. Y.—p. 1013.
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Archives of Dermatology and Syphilology, Chicago

41: 1-192 (Jan.) 1940

- Röntgen Dosage in Dermatology Expressed in International Röntgens. G. M. MacKee and A. C. Cipollaro, New York.—p. 1.
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 Periphlebitis Nodularis Necroticans: Attempt at Definition and Classification. P. E. Bechet, New York.—p. 55.
 Bullous Eruption Following Sulfanilamide Therapy. E. Epstein, Oakland, Calif.—p. 61.
 *Dangers in Use of Cosmetics. G. L. Wolcott, Asbury Park, N. J.—p. 64.
 Inquiry into Cause of Pemphigus: Is It a Virus Disease? F. S. Markham and M. F. Engman Jr., St. Louis.—p. 78.
 Absorption of Röntgen Rays by Skin: Experimental Determinations. A. C. Cipollaro and A. Mutscheller, New York.—p. 87.
 *Diseases of Nails: Report of Cases of Onycholysis. E. C. Fox, Dallas, Texas.—p. 98.
 Urinary Excretion of Indoxyl (as Indican) by Infants with Eczema. H. Sharlit, Margaret M. Klumpp, Collaborator, New York.—p. 113.

Bismuth Therapy in Latent Plumbism.—Epstein presents two cases in which a painter and a smelter worker showed signs and symptoms of lead poisoning followed the administration of a bismuth compound in the treatment of a syphilitic infection. It is suggested that bismuth may replace the lead stored in the bones and tend to the mobilization of lead, with the development of such symptoms as cramps and a lead line. Prophylactic treatment of lead poisoning in those exposed to the influence of the metal may decrease the incidence of untoward reactions following bismuth therapy.

Dangers of Cosmetics.—Wolcott reviews selected literature on the composition of and dangers in the use of important cosmetics. The majority of injuries from cosmetics at present cosmesis in the field of allergic dermatoses. The aniline dyes and coal tar derivatives, in particular the paraphenylenediamine group, are the most serious offenders. Hair dyes, especially preparations for the eyelashes, are extremely dangerous. A new field of cosmetic manufacture, that of synthetic perfumes, is giving rise to many dermatoses. Nail polishes, although relatively innocuous, may cause extensive physical disturbance of the nails. Reference is made to the federal Food, Drug and Cosmetic Act of 1938, designed to regulate interstate and foreign commerce in these items. It is unfortunate that the law does not require listing of ingredients on the label, because in this manner potentially dangerous substances would be known to the consumer and, secondarily, racketeering prices for ingredients of low actual cost would be reduced.

Diseases of Nails.—Fox says there is evidence that diseases of the nails, excluding the pyogenic and fungous infections and changes associated with the inflammatory dermatoses, are often produced by endocrine dysfunction, particularly hypothyroidism and hypopituitarism. Systemic diseases, such as the anemias, avitaminosis and the endocrine disturbances, may present important changes of the nails. This report is based on the study of thirty cases of onycholysis. Of the thirty patients, twenty-eight were women and two were men. Twenty-seven had multiple

separations and three had separation of a single nail. Twenty had low basal metabolic rates and fifteen of these had other symptoms suggesting hypothyroidism, such as a tendency to gain weight easily, a requirement of eight to ten hours' sleep, easy fatigability, excessive susceptibility to cold weather, dryness of the skin and hair and brittle nails. Several had winter pruritus (pruritus hiemalis), with dryness of the skin over the entire body and in cool weather annoying itching, which was aggravated by frequent bathing. One patient had psoriasis of the elbows but there was no evidence of psoriasis of the nails; another had lichen planus without any inflammatory process of the nails, and one had recovered from lichen planus several months previously. Twenty-one showed improvement on thyroid medication, three did not improve and three were not observed for a sufficient period to determine the final results. The author tabulates the data in his thirty cases and then reviews the literature on the concurrence of abnormality of the nails with disorders of the thyroid and other endocrine dysfunctions. He concludes that the influence of the hormones on the development of the skin and its appendages should receive more consideration from the dermatologist.

Archives of Physical Therapy, Chicago

- 20: 721-784 (Dec.) 1939
 Post-Traumatic Painful Atrophy of Joints. R. K. Ghormley, Rochester, Minn.—p. 725.
 Electrical Potential Distribution in Phantoms at Low and High Frequencies. A. Kolin and F. T. Woodbury, New York.—p. 732.
 Galvanism in Treatment of Bronchial Strictures. J. D. Kernan and D. C. Baker Jr., New York.—p. 739.
 Modern Concepts of Prophylactic and Corrective Exercises. J. Weiss and H. J. Behrend, New York.—p. 746.
 Standards for Physical Therapy and Occupational Therapy Departments in a General Hospital. M. T. MacEachern, Chicago.—p. 753.

Archives of Surgery, Chicago

- 40: 1-160 (Jan.) 1940
 Successful Autotransplantation of Adrenal Gland in Dog. J. L. Keeley, J. E. Dunphy, T. B. Quigley and J. F. Bell, Boston.—p. 1.
 Mastectomy: Clinical Pathologic Study Demonstrating Why Most Mastectomies Result in Incomplete Removal of Mammary Gland. N. F. Hicken, Salt Lake City.—p. 6.
 Report of Five Cases. J. R. Lisa and D. S. Likely, New York.—p. 15.
 Cerebral Complications Following Surgical Operation: I. Etiology and Pathology. A. Behrend and Helena E. Riggs, Philadelphia.—p. 24.
 Tissue Metabolism and Phosphatase Activity in Early Callus. J. P. Tollman, Omaha; D. H. Drummond, Dayton, Ohio; J. P. Carpus, with Reference to Fractured Navicular Bone. E. F. Cave, Boston.—p. 54.
 Aberrant Adrenal Tumor of Upper Part of Abdomen: Report of Case with Six Year Cure. S. F. MacMillan and J. B. Gilbert, Schenectady, N. Y.—p. 77.
 Carcinoma of Rectum and of Rectosigmoid in the Young. C. W. Mayo and G. F. Madding, Rochester, Minn.—p. 83.
 Ankle Fusion for Correction of Paralytic Drop Foot and Calcaneus Deformities. B. B. King, New York.—p. 90.
 Experimental Goiter Due to Calcium. C. A. Hellwig, Wichita, Kan.—p. 98.
 Etiology of Stone in Common Bile Duct. R. F. Carter, C. H. Greene, J. R. Twiss and R. Holtz, New York.—p. 103.
 Lymphosarcoma of Stomach. G. F. Madding and W. Walters, Rochester, Minn.—p. 120.
 Primary Carcinoma of Terminal Portion of Common Bile Duct. B. Pines and J. Rabinovitch, Brooklyn.—p. 135.
 Severe Hemorrhage in Gastric and in Duodenal Ulcer: Study of Ninety Cases. C. W. Holman, New York.—p. 150.

Cerebral Complications Following Surgery.—Behrend and Riggs show that the various cerebral complications encountered after surgical operation may be the result of cerebral anoxia resulting from acute general circulatory collapse precipitated by the anesthetic, plus the trauma of operation, in persons whose margin of circulatory reserve has been reduced by a masked chronic circulatory insufficiency. The brain and viscera of twenty-one patients dying after operation at the Philadelphia General Hospital have been examined. In each case symptoms referable to the cerebrum complicated the post-operative course. Preoperatively only six of the patients could be considered poor surgical or anesthetic risks. The diversity of symptoms reported by other observers is a strong argument against the theory of cerebral vascular accident. In the twenty-one cases the symptoms (psychic disturbances, prolonged coma, convulsions, focal paralyses and death during operation) were usually those suggesting diffuse involvement of the entire brain

and, as a rule, at some period more than one symptom was present in each case. Fourteen of the patients in the series surviving longer than twelve hours died with hyperpyrexia unexplainable on an infectious basis. Gross inspection of the brains of the twenty-one patients lent no support to the theory of infarction as a result of embolism. Microscopically, Courville's theory of widespread cellular degeneration throughout the brain, regardless of the type of clinical manifestation of cerebral involvement, was confirmed. Generalized capillary damage with widespread parenchymatous degeneration due to pericellular and interstitial edema was present in every case. Although the edema due to capillary damage was universal, the cellular degeneration was most marked in the association areas of the third and fourth ventricles and lenticular nucleus, the dentate and Purkinje cells of the cerebellum and the region of the inferior olive in the medulla. As these are the areas that Chornyak found most severely affected in animals subjected to atmospheres deficient in oxygen, this would further suggest that Courville's theory of asphyxia as a factor in the production of cerebral symptoms after anesthesia might be extended to include not only nitrous oxide anesthesia but all forms of anesthesia. Patients who survived less than forty-eight hours showed no evidence of reaction indicating attempted repair. Eight of the ten patients who survived from two to nine days showed focal areas of glial and phagocytic activity, suggesting beginning repair and scar formation. The cerebral symptoms were not related to the duration or type of anesthesia. Since edema and congestion not only of the brain but also of the viscera were observed at necropsy, it would seem that the cerebral degeneration is more reasonably attributable to the combined effect of anesthesia and operation on an impaired general circulatory efficiency with secondary reflection in the brain than to a direct selective anoxia of the brain cells alone.

Rectal Carcinoma in the Young.—The factors which influence the prognosis of carcinoma of the rectum and of the rectosigmoid in persons 30 or less years of age are multiple, although the most important are the ability of the patient to withstand the effects of removal and the presence or absence of metastasis. The latter factor closely parallels the grade of tumor as classified by Broders. Mayo and Madding review 116 cases of carcinoma of the rectum and of the rectosigmoid in persons 30 or less years of age. Of the patients with grade 1 carcinoma subjected to some form of curative operation, 75 per cent survived the five year period. There was a decrease of 28 per cent for the next grade, and only 10 per cent of the patients with grade 3 tumors survived the five year period. The data support the contention of other reports that carcinoma in young persons is usually of a higher grade than in older persons. Patients with lesions situated low in the rectum for which some form of posterior resection was performed were found to have an average postoperative life of 5.8 years, with operative mortality of only 2.7 per cent. The combined operative mortality for the entire group treated by resection was 12.3 per cent.

Arkansas Medical Society Journal, Fort Smith

- 36: 173-196 (Jan.) 1940
 Analgesia and Anesthesia in Obstetrics. C. D. Rodgers, Little Rock.—p. 173.
 Heart Diseases from Which the Patient May Recover. F. W. Harris, Little Rock.—p. 176.
 Study of Bacillary Dysentery. L. D. Massey and Hortense Louckes, Osceola.—p. 180.
 The Authority of a Subpena. P. A. Deisch, Helena.—p. 182.

Journal Industrial Hygiene & Toxicology, Baltimore

- 21: 479-532 (Dec.) 1939
 Study of Fate in Organism of Some Chlorinated Hydrocarbons. H. M. Barrett, J. G. Cunningham and J. H. Johnston, Toronto.—p. 479.
 Use of Interferometer for Two Component Mixtures. G. C. Harrold and L. E. Gordon, Detroit.—p. 491.
 Tissue Reaction to Some Carbon Arc Dusts. E. L. MacQuiddy, J. P. Tollman, L. W. La Towsky and S. Schonberger, Omaha.—p. 498.
 Acute Poisoning in Animals After Intraperitoneal and Intratracheal Administration of Dusts. J. P. Tollman, E. L. MacQuiddy and L. W. La Towsky, Omaha.—p. 514.
 Distribution of Electric Current in Animal Body: Experimental Investigation of 60 Cycle Alternating Current. A. W. Weeks and L. Alexander, with technical collaboration of R. M. Dennis, Boston.—p. 517.

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 Absorption of Roentgen Rays by Skin: Experimental Determinations. A. C. Cipollaro and A. Mutscheller, New York.—p. 87.
 *Diseases of Nails: Report of Cases of Onycholysis. E. C. Fox, Dallas, Texas.—p. 98.
 Urinary Excretion of Indoxyl (as Indican) by Infants with Eczema. H. Sharlit, Margaret M. Klumpp, Collaborator, New York.—p. 113.

Bismuth Therapy in Latent Plumbism.—Epstein presents two cases in which a painter and a smelter worker showed signs and symptoms of lead poisoning followed the administration of a bismuth compound in the treatment of a syphilitic infection. It is suggested that bismuth may replace the lead stored in the bones and tend to the mobilization of lead, with the development of such symptoms as cramps and a lead line. Prophylactic treatment of lead poisoning in those exposed to the influence of the metal may decrease the incidence of untoward reactions following bismuth therapy.

Dangers of Cosmetics.—Wolcott reviews selected literature on the composition of and dangers in the use of important cosmetics. The majority of injuries from cosmetics at present belong in the field of allergic dermatoses. The aniline dyes and coal tar derivatives, in particular the paraphenylenediamine group, are the most serious offenders. Hair dyes, especially preparations for the eyelashes, are extremely dangerous. A new field of cosmetic manufacture, that of synthetic perfumes, is giving rise to many dermatoses. Nail polishes, although relatively innocuous, may cause extensive physical disturbance of the nails. Reference is made to the federal Food, Drug and Cosmetic Act of 1938, designed to regulate interstate and foreign commerce in these items. It is unfortunate that the law does not require listing of ingredients on the label, because in this manner potentially dangerous substances would be known to the consumer and, secondarily, racketeering prices for ingredients of low actual cost would be reduced.

Diseases of Nails.—Fox says there is evidence that diseases of the nails, excluding the pyogenic and fungous infections and changes associated with the inflammatory dermatoses, are often produced by endocrine dysfunction, particularly hypothyroidism and hypopituitarism. Systemic diseases, such as the anemias, avitaminosis and the endocrine disturbances, may present important changes of the nails. This report is based on the study of thirty cases of onycholysis. Of the thirty patients, twenty-eight were women and two were men. Twenty-seven had multiple

separations and three had separation of a single nail. Twenty had low basal metabolic rates and fifteen of these had other symptoms suggesting hypothyroidism, such as a tendency to gain weight easily, a requirement of eight to ten hours' sleep, easy fatigability, excessive susceptibility to cold weather, dryness of the skin and hair and brittle nails. Several had winter pruritus (pruritus hiemalis), with dryness of the skin over the entire body and in cool weather annoying itching, which was aggravated by frequent bathing. One patient had psoriasis of the elbows but there was no evidence of psoriasis of the nails; another had lichen planus without any inflammatory process of the nails, and one had recovered from lichen planus several months previously. Twenty-one showed improvement on thyroid medication, three did not improve and three were not observed for a sufficient period to determine the final results. The author tabulates the data in his thirty cases and then reviews the literature on the concurrence of abnormality of the nails with disorders of the thyroid and other endocrine dysfunctions. He concludes that the influence of the hormones on the development of the skin and its appendages should receive more consideration from the dermatologist.

Archives of Physical Therapy, Chicago

20: 721-784 (Dec.) 1939

- Post-Traumatic Painful Atrophy of Joints. R. K. Ghormley, Rochester, Minn.—p. 725.
Electrical Potential Distribution in Phantoms at Low and High Frequencies. A. Kolin and F. T. Woodbury, New York.—p. 732.
Galvanism in Treatment of Bronchial Strictures. J. D. Kernan and D. C. Baker Jr., New York.—p. 739.
Modern Concepts of Prophylactic and Corrective Exercises. J. Weiss and H. J. Behrend, New York.—p. 746.
Standards for Physical Therapy and Occupational Therapy Departments in a General Hospital. M. T. MacEachern, Chicago.—p. 753.

Archives of Surgery, Chicago

40: 1-160 (Jan.) 1940

- Successful Autotransplantation of Adrenal Gland in Dog. J. L. Keeley, J. E. Dunphy, T. B. Quigley and J. F. Bell, Boston.—p. 1.
Mastectomy: Clinical Pathologic Study Demonstrating Why Most Mastectomies Result in Incomplete Removal of Mammary Gland. N. F. Hicken, Salt Lake City.—p. 6.
Infection as Cause of Massive Hemorrhage in Chronic Peptic Ulcer: Report of Five Cases. J. R. Lisa and D. S. Likely, New York.—p. 15.
*Cerebral Complications Following Surgical Operation: I. Etiology and Pathology. A. Behrend and Helena E. Riggs, Philadelphia.—p. 24.
Tissue Metabolism and Phosphatase Activity in Early Callus. J. P. Tollman, Omaha; D. H. Drummond, Dayton, Ohio; A. R. McIntyre and J. D. Bisgard, Omaha.—p. 43.
Phosphatase Activity of Infected Fractures. D. H. Drummond, Dayton, Ohio; J. P. Tollman, J. D. Bisgard and D. Ross, Omaha.—p. 49.
Carpus, with Reference to Fractured Navicular Bone. E. F. Cave, Boston.—p. 54.
Aberrant Adrenal Tumor of Upper Part of Abdomen: Report of Case with Six Year Cure. S. F. MacMillan and J. B. Gilbert, Schenectady, N. Y.—p. 77.
*Carcinoma of Rectum and of Rectosigmoid in the Young. C. W. Mayo and G. F. Madding, Rochester, Minn.—p. 83.
Ankle Fusion for Correction of Paralytic Drop Foot and Calcaneus Deformities. B. B. King, New York.—p. 90.
Experimental Goiter Due to Calcium. C. A. Hellwig, Wichita, Kan.—p. 98.
Etiology of Stone in Common Bile Duct. R. F. Carter, C. H. Greene, J. R. Twiss and R. Holtz, New York.—p. 103.
Lymphosarcoma of Stomach. G. F. Madding and W. Walters, Rochester, Minn.—p. 120.
Primary Carcinoma of Terminal Portion of Common Bile Duct. B. Pines and J. Rabinovitch, Brooklyn.—p. 135.
Severe Hemorrhage in Gastric and in Duodenal Ulcer: Study of Ninety Cases. C. W. Holman, New York.—p. 150.

Cerebral Complications Following Surgery.—Behrend and Riggs show that the various cerebral complications encountered after surgical operation may be the result of cerebral anoxia resulting from acute general circulatory collapse precipitated by the anesthetic, plus the trauma of operation, in persons whose margin of circulatory reserve has been reduced by a masked chronic circulatory insufficiency. The brain and viscera of twenty-one patients dying after operation at the Philadelphia General Hospital have been examined. In each case symptoms referable to the cerebrum complicated the post-operative course. Preoperatively only six of the patients could be considered poor surgical or anesthetic risks. The diversity of symptoms reported by other observers is a strong argument against the theory of cerebral vascular accident. In the twenty-one cases the symptoms (psychic disturbances, prolonged coma, convulsions, focal paralyses and death during operation) were usually those suggesting diffuse involvement of the entire brain

and, as a rule, at some period more than one symptom was present in each case. Fourteen of the patients in the series surviving longer than twelve hours died with hyperpyrexia unexplainable on an infectious basis. Gross inspection of the brains of the twenty-one patients lent no support to the theory of infarction as a result of embolism. Microscopically, Courville's theory of widespread cellular degeneration throughout the brain, regardless of the type of clinical manifestation of cerebral involvement, was confirmed. Generalized capillary damage with widespread parenchymatous degeneration due to pericellular and interstitial edema was present in every case. Although the edema due to capillary damage was universal, the cellular degeneration was most marked in the association areas of the cortex, the sympathetic ganglions in the gray matter around the third and fourth ventricles and lenticular nucleus, the dentate and Purkinje cells of the cerebellum and the region of the inferior olive in the medulla. As these are the areas that Chornyak found most severely affected in animals subjected to atmospheres deficient in oxygen, this would further suggest that Courville's theory of asphyxia as a factor in the production of cerebral symptoms after anesthesia might be extended to include not only nitrous oxide anesthesia but all forms of anesthesia. Patients who survived less than forty-eight hours showed no evidence of reaction indicating attempted repair. Eight of the ten patients who survived from two to nine days showed focal areas of glial and phagocytic activity, suggesting beginning repair and scar formation. The cerebral symptoms were not related to the duration or type of anesthesia. Since edema and congestion not only of the brain but also of the viscera were observed at necropsy, it would seem that the cerebral degeneration is more reasonably attributable to the combined effect of anesthesia and operation on an impaired general circulatory efficiency with secondary reflection in the brain than to a direct selective anoxia of the brain cells alone.

Rectal Carcinoma in the Young.—The factors which influence the prognosis of carcinoma of the rectum and of the rectosigmoid in persons 30 or less years of age are multiple, although the most important are the ability of the patient to withstand the effects of removal and the presence or absence of metastasis. The latter factor closely parallels the grade of the tumor as classified by Broders. Mayo and Madding review 116 cases of carcinoma of the rectum and of the rectosigmoid in persons 30 or less years of age. Of the patients with grade 1 carcinoma subjected to some form of curative operation, 75 per cent survived the five year period. There was a decrease of 28 per cent for the next grade, and only 10 per cent of the patients with grade 3 tumors survived the five year period. The data support the contention of other reports that carcinoma in young persons is usually of a higher grade than in older persons. Patients with lesions situated low in the rectum for which some form of posterior resection was performed were found to have an average postoperative life of 5.8 years, with an operative mortality of only 2.7 per cent. The combined operative mortality for the entire group treated by resection was 12.3 per cent.

Arkansas Medical Society Journal, Fort Smith

36: 173-196 (Jan.) 1940

- Analgesia and Anesthesia in Obstetrics. C. D. Rodgers, Little Rock.—p. 173.
Heart Diseases from Which the Patient May Recover. F. W. Harris, Little Rock.—p. 176.
Study of Bacillary Dysentery. L. D. Massey and Hortense Louckes, Osceola.—p. 180.
The Authority of a Subpena. P. A. Deisch, Helena.—p. 182.

Journal Industrial Hygiene & Toxicology, Baltimore

21: 479-532 (Dec.) 1939

- Study of Fate in Organism of Some Chlorinated Hydrocarbons. H. M. Barrett, J. G. Cunningham and J. H. Johnston, Toronto.—p. 479.
Use of Interferometer for Two Component Mixtures. G. C. Harrold and L. E. Gordon, Detroit.—p. 491.
Tissue Reaction to Some Carbon Arc Dusts. E. L. MacQuiddy, J. P. Tollman, L. W. La Towsky and S. Schonberger, Omaha.—p. 493.
Acute Poisoning in Animals After Intraperitoneal and Intratracheal Administration of Dusts. J. P. Tollman, E. L. MacQuiddy and L. W. La Towsky, Omaha.—p. 514.
Distribution of Electric Current in Animal Body: Experimental Investigation of 60 Cycle Alternating Current. A. W. Weeks and L. Alexander, with technical collaboration of R. M. Dennis, Boston.—p. 517.

Journal-Lancet, Minneapolis

59: 521-568 (Dec.) 1939

- Management of Traumatic Wounds. C. J. Glaspel, Grafton, N. D.—p. 521.
- Repair of Tendons of Hand. H. E. Cleveland, Burlington, Wash.—p. 524.
- Rupture and Repair of Ossified Achilles Tendon. H. J. Knott, Seattle.—p. 526.
- Coronary Thrombosis. C. B. Wright, Minneapolis.—p. 527.
- Treatment for Acute Fractures of Os Calcis. O. W. Yoerg, Minneapolis.—p. 530.
- Fractures of Metatarsal Bones. B. J. Branton, Willmar, Minn.—p. 534.
- Emergency Ophthalmology. J. E. Reeder, Sioux City, Iowa.—p. 536.
- Management of Opacities of Cornea. F. A. Kiehle, Portland, Ore.—p. 537.
- *Traumatic Appendicitis. G. N. Pease, Portland, Ore.—p. 539.
- Traumatic Rupture of Kidney. A. N. Collins, Duluth, Minn.—p. 541.
- Traumatic Rupture of Normal Spleen with Delayed Hemorrhage. R. C. Webb, Minneapolis.—p. 545.
- Lordosis Associated with Tetanus. H. E. Wheeler, Spokane, Wash.—p. 548.
- Osteomyelitis. A. C. Baker, Fergus Falls, Minn.—p. 550.
- Eye Health of College Student. Anette M. Phelan Watson, New York.—p. 552.

Traumatic Appendicitis.—Pease asserts that traumatic appendicitis is a definite clinical entity and as such must be recognized not only by physicians but also by the courts in questions of litigation and compensation. Cases of so-called traumatic appendicitis can be found in the literature. It is nevertheless hard to believe. The trauma of traumatic appendicitis should not be thought of as a direct injury to the appendix as in the case of the liver and spleen but as trauma applied to the abdominal wall and its contents, which consist not only of solid organs but of gas and fluid as well. This means that force can be transmitted in all directions and therefore that the contents of the cecum and even the ascending colon can be forced into the appendix. The appendix can be so distended as a result of this force as possibly to rupture the mucosa and thus offer an avenue for the ever present infectious organisms to invade the wall of the appendix and start an acute inflammatory condition. In the presence of a fecalith in the lumen of the appendix it can be reasoned that this same trauma can cause the fecalith to injure the mucosa of the appendix and thus leave an avenue for a source of infection. This same fecalith or foreign body can block the exit of gas and contents from the appendix and permit swelling and possible perforation to result.

Journal of Pediatrics, St. Louis

15: 745-906 (Dec.) 1939

- Electro-Encephalography in Epilepsy. F. A. Gibbs, Boston.—p. 749.
- *Cystic Fibrosis of Pancreas, Vitamin A Deficiency and Bronchiectasis. Dorothy H. Andersen, New York.—p. 763.
- Etiology of Rheumatic Fever: Discussion. T. D. Jones, Boston.—p. 772.
- Diagnosis and Effects of Ligation of Patent Ductus Arteriosus: Report of Eleven Cases. L. T. Bullock, J. C. Jones and F. S. Doley, Los Angeles.—p. 786.
- *Role of Vitamin K in Etiology, Prevention and Treatment of Hemorrhage in Newborn Infant: Part II. W. W. Waddell Jr. and D. Guerry 3d, University, Va.—p. 802.
- *Vitamin A Requirements in Infancy as Determined by Dark Adaptation. J. M. Lewis and C. Haig, New York.—p. 812.
- Plasma Ascorbic Acid of Infants and Children. C. E. Snelling, Toronto.—p. 824.
- Probable Adrenal Insufficiency in Infant: Report of Case. A. M. Butler, R. A. Ross and N. B. Talbot, Boston.—p. 831.
- Place of Encephalography in Prognosis in Childhood. J. K. Brines and Elizabeth Lord, Boston.—p. 836.
- Arachnoidectomy: Report of Case with Autopsy, Including Histologic Examination of Eye. A. C. Rambar and E. J. Denenholz, Chicago.—p. 844.

Cystic Fibrosis of Pancreas.—Andersen states that cystic fibrosis of the pancreas is a disease entity which can be diagnosed with probability on clinical grounds and proved by the assay of pancreatic enzymes in the duodenal juice. The diagnosis may be suggested on the basis of neonatal onset, large foul stools, failure to gain in the presence of a good appetite while taking an adequate diet, a tendency to repeated or chronic respiratory infections and a history of similar disease in siblings. All cases of bronchiectasis or xerophthalmia in infancy should be strongly suspected. As to treatment, the best advice is to give from 20 to 40 per cent more than the estimated caloric requirement of a celiac diet and to modify this by the use of whole milk mixed with pancreatin. Vitamin A should be administered generously.

Vitamin K and Hemorrhage.—Waddell and Guerry believe that a direct relation exists between the prothrombin content of the blood and the bleeding that occurs in hemorrhagic dis-

ease of the newborn. They report four cases of subclinical hemorrhagic disease and one case of spontaneous bleeding, all successfully treated with vitamin K concentrate. The hypothesis is advanced that marked prothrombin deficiency is the immediate cause of the syndrome known as hemorrhagic disease of the newborn and that subclinical cases without spontaneous bleeding are of frequent occurrence. The same condition of bleeding is probably present at birth and may in fact account for many instances of intracranial hemorrhage associated with normal labor and delivery. It seems that intracranial bleeding associated with normal delivery can be lessened by preventive treatment, that is treating the infant with vitamin K through the mother. The authors have found synthetic vitamin K (2-methyl-1, 4-naphthoquinone) to be efficacious.

Vitamin A and Dark Adaptation.—Lewis and Haig determined the minimal light threshold after complete dark adaptation of fifty-three infants ranging in age from 1½ to 13 months. These infants were on four different diets. The diets were given for periods varying from three to ten months. The results of the dark adaptation tests were within normal limits for all four groups of infants. Thus, infants receiving only from 135 to 200 vitamin A units daily had as low a threshold for vision in the dark as infants receiving an average diet supplemented by 17,000 vitamin A units. It should also be added that the infants in the low vitamin A group gained weight just as well as those in the high vitamin A group and were no more susceptible to infections. As the average diet contains approximately twelve times as many units of vitamin A as were contained in the low vitamin A diet, it is apparent that there is a large margin of safety in the infant's diet with respect to its vitamin A content. Therefore it seems unnecessary to supplement the average diet of infants with special preparations containing vitamin A. Three infants, two of whom had eczema, received as a substitute for milk a proprietary preparation containing soy bean, starch and olive oil. This product is almost devoid of vitamin A. In from three to four weeks these infants manifested poor dark adaptation. The addition of 120 units of vitamin A resulted in normal dark adaptation in two of these infants. When a single large dose of vitamin A, from 30,000 to 50,000 units, was given these two infants who had high threshold values, a prompt response occurred; dark adaptation returned to normal in forty minutes in one infant and in sixty-five minutes in the other infant. In the period during which the three infants on the soy bean diet had poor dark adaptation, they gained well in height and in weight and were no more susceptible to infections than infants receiving large quantities of vitamin A. It is concluded that they had a latent or sub-clinical form of vitamin A deficiency which became evident only as a result of the dark adaptation tests.

Journal of Thoracic Surgery, St. Louis

9: 119-236 (Dec.) 1939

- Two Interesting Benign Lung Tumors of Contradictory Histopathology: Remarks on Necessity for Maintaining Chest Tumor Registry. H. Brunn, San Francisco.—p. 119.
- Benign Chondromas of Ribs. F. R. Harper, Denver.—p. 132.
- Primary Tumors of Ribs: Report of Eight Cases and Method of Repair of Defect in Chest Wall That Follows Their Removal. R. M. Janes, Toronto.—p. 145.
- Pectus Excavatum (Funnel Chest): Anatomic Basis, Surgical Treatment of Incipient Stage in Infancy and Correction of Deformity in Fully Developed Stage. A. L. Brown, San Francisco.—p. 164.
- Malignant Tumors of Diaphragm. J. W. Gale and S. R. Edwards, Madison, Wis.—p. 185.
- Observations on Effect of Amyl Nitrite on Bronchial Tree. W. F. Nicholson, Cheshire, England.—p. 194.
- Surgical Correction of Congenital Atresia of Esophagus with Tracheo-Esophageal Fistula: Case Report. R. Shaw, Dallas, Texas.—p. 211.
- Esophagus After Pneumectomy. H. C. Maier, New York, and A. A. Ehler, Los Angeles.—p. 220.
- Lipiodol in Pericardium: Experimental Study. G. E. Lindley and R. Tennant, New Haven, Conn.—p. 227.

New Jersey Medical Society Journal, Trenton

37: 1-46 (Jan.) 1940

- Hemoptysis: Its Causes, Significance and Treatment. B. S. Pollak and S. Cohen, Jersey City.—p. 7.
- Use of Roentgen Rays in Treatment of Furuncles and Carbuncles. E. A. May, East Orange.—p. 14.
- Influenza and Its Sequelae in Cardiovascular System. C. L. Andrews, Atlantic City.—p. 16.
- Successful Treatment of Case of Hypogonadism with Testosterone Propionate. M. Melitch, Atlantic City.—p. 20.
- Who Pays the Penalty When the Legal Procedure in Adoption Is Stopped? Ellen C. Potter, Trenton.—p. 22.

New York State Journal of Medicine, New York

40: 1-76 (Jan. 1) 1940

- Giant Follicle Lymphoblastoma: Benign Variety of Lymphosarcoma. G. Bachr and P. Klemperer, New York.—p. 7.
- *Clinical Study of Hypnotics: Effect on Gross Sleep Movements, Length of Sleep, Blood Pressure, Respiratory Rate and Pulse Rate. F. Meyers, E. D. Cook, Buffalo, and R. C. Page, Mount Vernon.—p. 12.
- Presenting Certified Milk to the Profession. S. A. Cohen, New York.—p. 20.
- Spas: "Have Spas an Essential Place in the National Economy and How Responsible Is Organized Medicine in Its Efforts to Promote and Control Their Activities?" J. Carroll, New York.—p. 23.
- Early Recognition of Mental Diseases and Their Treatment. C. O. Cheney, White Plains.—p. 29.
- Role of Burrow's Solution in Dermatology. F. C. Combes, New York.—p. 37.
- Syphilis in Pregnancy. G. D. Astrachan, New York.—p. 43.
- Arsenical Hepatitis. J. R. Scott, New York.—p. 53.
- Anterior Poliomyelitis: Relation to Hypertension in Young Adults. H. D. Vickers, Little Falls.—p. 55.

Clinical Study of Hypnotics.—Meyers and his co-workers determined the influence of therapeutic doses of hypnotics on the length of sleep, the time of its onset, the number of gross movements during sleep and changes in pulse rate, respiratory rate and blood pressure. Subjects for the experiments were patients who were free from pain and were not having treatment which might have influenced their sleep. None of these patients received opiates or sedatives as part of their daytime treatment. The subjects received their usual ward routine care during the day, but from 9 p. m. to 8 a. m., and longer when necessary, they were kept in a separate room and were under the constant observation of a nurse especially trained for the study. The two beds used for the experiment were attached to actographs. The drugs used were a placebo, N-tolyl-butyl-ethyl-barbital, neonal, a urea derivative, sodium pentobarbital and sodium amytal. Various doses within the therapeutic range were administered. Each of these drugs was pressed into tablets, all having a similar appearance so that the subjects would not know what medication they were receiving. Twelve patients were studied for a total of 219 nights of observation. Each subject remained in the sleep room for a minimum of fourteen days and a maximum of twenty-six days. The placebos and the hypnotics were given in no definite order but each patient received the placebo at least four times during the course of study. The authors find that the time of onset of sleep was not more rapid after the use of any one hypnotic. The average length of sleep was increased about twenty minutes. The sleep pattern, as measured by the number of gross movements made during sleep, was not changed except in four cases of congestive heart failure. In these instances the hypnotics increased the number of movements during sleep. The pulse rate, respiratory rate and blood pressure in the twelve subjects with normal cardiovascular mechanisms was consistently depressed by the hypnotics, while the four patients with congestive heart failure showed but little change.

Public Health Reports, Washington, D. C.

54: 2159-2194 (Dec. 8) 1939

- Comparison of Occupational Class and Physicians' Estimate of Economic Status. Jennie C. Goddard.—p. 2159.
- *Effect of Fluorides on Salivary Amylase. F. J. McClure.—p. 2165.
- Cultivation of *Rickettsia Diapora* in Tissue Culture and in Tissues of Developing Chick Embryos. H. R. Cox and E. J. Bell.—p. 2171.
- Relapsing Fever: *Ornithodoros Hermsi*, a Vector in Colorado. G. E. Davis.—p. 2178.

54: 2195-2238 (Dec. 15) 1939

- Unusual Infestation of Ship with Black Widow Spiders.—p. 2195.
- Disabling Morbidity Among Employees in Slaughter and Meat Packing Industry, 1930-1934, Inclusive. H. P. Brinton, H. E. Seifert and Elizabeth S. Frasier.—p. 2196.
- Rickettsia Diapora*: Recovery of Three Strains from Dermacestor Andersoni Collected in Southeastern Wyoming: Their Identity with Montana Strain I. G. E. Davis.—p. 2219.

Effect of Fluorides on Salivary Amylase.—The fluorides sodium, potassium and ammonium fluoride and fluosilicate were found by McClure to have no effect on the activity of salivary amylase in concentrations varying from 1.7 to 8,550 parts per million of fluorine present in 1:10 dilutions of salivas which stood for one hour in the cold prior to testing of the amylolytic property. The same fluorides when present in the enzyme-substrate mixture during the digestion period, in concentrations varying from 0.76 to 760 parts per million of fluorine in the substrate, had no final effect on enzyme activity. The salivas of school children whose drinking water contained an average

of 1.8 parts per million of fluorine showed no differences in amylolytic action from a similar group of salivas obtained under similar conditions from school children whose drinking water was free from fluoride.

Rocky Mountain Medical Journal, Denver

37: 1-72 (Jan.) 1940

- Clinical Use of Gastroscopy. R. Schindler, Chicago.—p. 18.
- Advertising Claims versus Medical Facts: Blood Tonics. W. A. Rettberg, Denver.—p. 23.
- Id.: Cathartics. O. L. Huddleston, Denver.—p. 26.
- Id.: Sedatives. C. A. Rymer, Denver.—p. 28.
- Id.: Cosmetics. G. M. Frumess, Denver.—p. 31.
- Id.: Tobacco. R. T. Terry, Denver.—p. 33.
- Role of Medical Profession in Control of False and Misleading Advertising. K. E. Miller, Washington, D. C.—p. 35.
- One Year of the Blue Cross Plan. W. S. McNary, Denver.—p. 41.

Southern Medical Journal, Birmingham, Ala.

32: 1171-1264 (Dec.) 1939

- Advances in Treatment of Everyday Wounds. B. Douglas, Nashville, Tenn.—p. 1171.
- Surgery of So-Called Bilateral Renal Tuberculosis. R. B. Henline, New York.—p. 1185.
- Conservative Treatment of Congenital Clubfoot in Infants. L. S. Sell, Oklahoma City.—p. 1199.
- Surgical Management of Diverticulitis. C. Rosser, Dallas, Texas.—p. 1203.
- Variation in Morphologic Reaction to Injury: Discussion of Certain Aspects of Process of Inflammation, with Special Reference to Large Mononuclear Wandering Cells and Factors Governing Their Response to Injury. W. D. Forbes, Durham, N. C.—p. 1208.
- Pneumonia: Medical Treatment. L. J. Moorman, Oklahoma City.—p. 1216.
- Treatment of Pneumonia. W. Yeiser, Columbia, Tenn.—p. 1220.
- Treatment of Pneumonia in Infancy and Childhood with Sulfapyridine. E. B. Friedenwald and E. S. Bereston, Baltimore.—p. 1223.
- Early Roentgenologic Signs in Some of the More Common Disorders of Hip. J. B. Johnson and H. M. Anspach, Galveston, Texas.—p. 1228.
- Urologic Determination of Fecundity in the Male. R. J. Holmes, M. M. Coplan and F. M. Woods, Miami, Fla.—p. 1235.
- Treatment of Acute Cholecystitis: Immediate or Delayed Surgery. C. E. Clymer, Oklahoma City.—p. 1238.
- Pilonidal Cyst. J. P. Wolff, Oklahoma City.—p. 1243.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

47: 661-734 (Dec.) 1939

- Avertin Anesthesia for Thyrotoxicosis. E. C. Cutler and S. O. Hoerr, Boston.—p. 661.
- Use of Pentothal Sodium in Intravenous Anesthesia. N. E. Hamilton, Portland, Ore.—p. 668.
- Choice of Anesthetic Agents and Methods for Surgical Procedures. J. H. Hutton, Portland, Ore.—p. 673.
- Safeguarding the Unconscious Operative Patient. T. F. Mullen, San Francisco.—p. 678.
- Bronchoscopy in Relation to Thoracic Surgery. P. C. Samson, Oakland, Calif.—p. 687.
- *Appendicostomy for Chronic Ulcerative Colitis. G. F. Cushman and A. R. Kilgore, San Francisco.—p. 692.
- Treatment of Cancer of Lip. G. S. Sharp, Pasadena, Calif., and H. D. Smith, Los Angeles.—p. 695.
- Surgical Approach to Hypertension: Division X. F. M. Findlay, San Diego, Calif.—p. 706.

Appendicostomy for Chronic Ulcerative Colitis.—Compared to ileostomy or colostomy in chronic ulcerative colitis, Cushman and Kilgore state that appendicostomy is an operation carrying little or no risk, it is devoid of the major unpleasant aspects of ileostomy, conserving instead of losing fluid and salts, and it does not interfere with diagnostic studies, medical treatment or even later radical surgery if eventually necessary. From their experience with five cases they believe that appendicostomy should be done as soon as the diagnosis of chronic ulcerative colitis is established. They also believe that it is worth a trial even in late cases before resorting to colectomy. The authors are of the opinion that perhaps an important reason for lack of success with the procedure is the fact that appendicostomy has been done with the object of introducing antiseptics or astringents into the colon. This, they are sure, is in error. Its usefulness lies in keeping the intestine clean and free from the irritation of fecal debris and mucopurulent discharge. It provides rest, as near as may be, short of actual diversion of the fecal stream. The technic of appendicostomy (or cecostomy if the appendix has been removed or obliterated by disease) is simple. Care should be taken to avoid interference with circulation by too great traction on or constriction of the meso-appendix. Two of the authors' five patients, after appendicostomy for chronic ulcerative colitis, have been well for more than five years; three have been free from symptoms for sixteen, eight and six months, respectively. Irrigation should be with tap water or physiologic solution of sodium chloride.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

23: 745-796 (Dec.) 1939

*Underlying Causes of Glaucoma: Including Notes on Lines of Enquiry Which Have Been Pursued, with Suggestions as to Future Research in Clinic and Laboratory. P. J. Evans.—p. 745.

Underlying Causes of Glaucoma.—The hypothesis that Evans advances is that: 1. The causes of primary glaucoma are those of capillary and venous stasis, and the condition arises from the changes resulting from such a disturbance of the local circulation. 2. It is held that the symptom complex known as glaucoma includes a number of separate conditions the only features of which in common are those represented by ultimate decompensation of the mechanism provided for the excretion of fluid from within the eye. 3. It is shown that primary glaucoma or glaucoma simplex is the local manifestation of a general disease. It is well established that acute inflammation does not produce more than a fractional rise of tension. Only in the presence of stasis of the circulation in the capillaries and veins does inflammation produce obstruction. The adhesions produced by repeated attacks of inflammation, particularly those between the lens and the posterior surface of the iris, may however restrict the forward movement of the aqueous from the posterior to the anterior chamber, while the formation of a layer of exudate in the layers of and between the fibers of the suspensory ligament of the lens may prevent the exchange of fluids between the vitreous and the aqueous. In such circumstances increased tension may result from mechanical obstruction and a condition of secondary glaucoma is established. The bowing forward of the aqueous behind the iris in cases of ring synechiae is the expression of the greater amount of fluid derived from the increased vascularity of the choroid and ciliary processes, which constitute by far the greater part of the vascular bed. The increased tension in such cases is relieved by broad iridectomy, which breaks the ring of synechiae and reopens the way between the anterior and posterior chambers. In such cases this procedure results in a permanent cure of increased tension, provided further exudates do not block the iridectomy.

British Medical Journal, London

2: 1173-1214 (Dec. 16) 1939

Clinical Porphyria: Report of Case of Acute Idiopathic Type. F. G. Chandler, G. A. Harrison and C. Rimington.—p. 1173.

Causes of Postpartum Hemorrhage. F. Murray.—p. 1180.

Ophthalmic Injuries from Mustard Gas (Dichloroethyl Sulfide). J. Foster.—p. 1181.

*Rapid Presumptive Serologic Test for Weil's Disease. H. C. Brown.—p. 1183.

*Effect of Heat and Cold on Hemorrhage. S. B. Stoker.—p. 1185.

Rapid Presumptive Test for Weil's Disease.—The test that Brown suggests consists in rocking small quantities of varying dilutions of the patient's serum in the presence of a heavy suspension of *Leptospira icterohaemorrhagiae*. This saline suspension is formalized to a concentration of 0.2 per cent. As *Leptospira* cannot be easily thrown down by means of a centrifuge from the fluid medium in which it is grown, the sedimentation of *Leptospira* from the medium will be facilitated when it is centrifuged by adding to the fluid medium saponin up to a total concentration of 1:1,000. The addition may be made after the culture has been formalized, which makes the procedure free from any risk of infection. Four human strains were compared as regards their agglutinability, both when put up in a water bath for three hours at 56 C. and on the rocking slide. The same serum was used in all cases. The two procedures gave exactly the same titers, but the titers varied according to the strain used. It is thus evident that the strain to be used as an antigen in serologic tests must be highly concentrated and carefully chosen. The dilutions of the serum are made in the depressions of a painter's palette, as in Schüffner's method. They are then mixed with an equal volume of antigen and placed on the slide. This is rocked back and forth for ten minutes, and the result is read by means of a hand lens against a dark background. Numerous serums have been tested by this method and by the macroscopic method after incubation for three hours in a water bath at 56 C. The results have been compared with those obtained with Schüffner's technic and they have been consistently identical, but in every instance Schüffner's

technic has given a titer three times higher than that obtained by either of the other methods. The rocking slide method, given a suitable antigen, will produce a result within fifteen minutes of the receipt of the serum and it is reliable enough to justify the administration of curative serum.

Effect of Heat and Cold on Hemorrhage.—By a series of experiments performed as a preliminary to other work on blood coagulation time, Stoker observed that heat shortened bleeding time but cold greatly prolonged it. It is known that the coagulation time of blood is affected by changes of temperature, but the duration of bleeding time appears to be altered more by the effect of temperature on the tissues than on the blood itself. As bleeding is controlled by plugging the damaged vessels with blood clot, the aim of treatment ought to be directed to this end. Heat is obviously the means to attain this rather than cold, which merely narrows the vessels without accelerating the plugging process. Many men, when questioned, recall that they bleed from a shaving cut much longer on a cold winter day than on a warm summer day.

Journal of Mental Science, London

85: 1141-1326 (Nov.) 1939

Maternal Age, Order of Birth and Developmental Abnormalities. L. S. Penrose.—p. 1141.

*Creatinine in Mentally Defective Patients. L. S. Penrose and Cecelia E. M. Pugh.—p. 1151.

Feeding in Infancy and Subsequent Psychologic Difficulties. B. C. F. Rogerson and C. H. Rogerson.—p. 1163.

Interrelations of Mental Defect and Mental Disorder. M. Hayman.—p. 1183.

Relationship of Dementia Praecox to Mental Deficiency. S. G. James.—p. 1194.

Study of Folie à Deux. S. M. Coleman and S. L. Last.—p. 1212.

Prognosis in Schizophrenia: Based on Follow-Up Study of 129 Cases Treated by Ordinary Methods. H. Stalker.—p. 1224.

Wassermann and Meinicke Klärungs Reactions (Original M. K. R. II and Ford Analysis) in Diagnosis of Syphilis: ts. J. C. Thomas, with note by W. M. F.

*Sulfanilamide in Bacillary Dysentery. E. Jones and D. W. Abse.—p. 1259.

Creatinine in Mentally Defective Patients.—Penrose and Pugh estimated in duplicate the creatinine and the creatine in more than 500 early morning specimens of urine from almost 300 male and 100 female mentally defective persons. The patients were kept on ordinary institution diet. The results were expressed as creatinine level and ratio of creatine to creatinine. With use of this simple procedure, the following well established observations were apparent: (1) in muscular dystrophy and in diplegia, creatine excretion was greatly increased at the expense of creatinine, (2) in hemiplegia, by contrast, the results were normal, (3) high creatine was found in hyperthyroidism and (4) in children high creatine and low creatinine were found. The authors believed the method to be qualitatively reliable and they made the following further observations: 1. In cerebellar ataxia and in postencephalitic lethargy creatinine excretion was found to be high. 2. Apart from postencephalitis, no abnormality of creatinine-creatinine excretion was apparent in psychosis with a mental defect. 3. There appeared to be a slight increase in creatine excretion in congenital syphilis. 4. Mongols and epileptic persons gave normal results. 5. Among endocrine dystrophies, results were irregular and in accordance with the nature of each case. It was observed that slight creatinuria is normal on a diet which contains probably less creatine daily than the usual test dose of the drug, even when the estimation is made on an early morning specimen of urine. There is no significant difference between the average creatine excretion of men and women patients. Owing probably to their greater average size and consequently greater muscle bulk, the average creatinine excretion of men is greater than that of women.

Sulfanilamide for Bacillary Dysentery.—As a result of laboratory experiments, Jones and Abse gave sulfanilamide to twenty-one patients suffering from dysentery caused by the bacillus of Flexner. As soon as the clinical diagnosis was established, two 0.5 Gm. tablets were given three times a day for two days. This was followed by one 0.5 Gm. tablet three times a day for two days, making a total of eighteen tablets. All the patients treated had definite fever, toxemia, abdominal pain and tenesmus. The diagnosis of each case was confirmed bacteriologically by the isolation of the bacillus of Flexner, mostly of the W type. Within twenty-four to forty-eight

hours of the first dose of the drug the temperature fell to normal; shortly after this the passage of stools containing blood and mucus ceased, to be followed by the passage of formed stools from which the bacillus of Flexner could not be isolated. An attempt is now being made to investigate its effect on chronic carriers.

Journal of Physiology, Cambridge

97:1-132 (Nov.) 1939. Partial Index

- Effect of Noxious Agents on Creatine, Creatinine, Chloride and Water Excretion. J. S. L. Browne, S. Karady and H. Selye.—p. 1.
Quick Component of Nystagmus. A. K. McIntyre.—p. 8.
Blood Flow Through Muscle During Sustained Contraction. H. Barcroft and J. L. E. Millen.—p. 17.
Gastric Carbonic Anhydrase. H. W. Davenport.—p. 32.
Effect of Choline on Fatty Liver of Carbon Tetrachloride Poisoning. H. M. Barrett, C. H. Best, D. L. MacLean and Jessie H. Ridout.—p. 103.
Diet and Insulin Content of Pancreas. C. H. Best, R. E. Haist and Jessie H. Ridout.—p. 107.

Lancet, London

2:1253-1298 (Dec. 16) 1939

- Surgery of Common Bile Duct. J. Walton.—p. 1253.
Paraplegic Beriberi: Case. J. B. Young.—p. 1257.
Prevention of Foot Deformities in Children. Margaret Emslie.—p. 1260.
Fresh and Stored Placental Blood. J. Halbrecht.—p. 1263.
Sulfapyridine in Lymphopathia Venereum. K. V. Earle.—p. 1265.
Drip Flow Meter for Transfusion. S. R. Gloyne and Phyllis M. Tookey Kerridge.—p. 1267.

Fresh and Stored Placental Blood.—Of the three sources of stored blood (donors, cadavers and placentas) Halbrecht's paper is concerned with the last. Placental blood is easily obtained and easily stored. The pooling of blood for a simple transfusion is an advantage, for it diminishes rather than increases the possibility of a reaction due to incompatibility. In most of his transfusions the author used blood from five or six placentas, and in 220 such transfusions he never saw a severe reaction. Dyspnea was observed in one case and chills in eleven. This incidence of reactions (5 per cent) can be expected also when fresh blood is used. The author discusses the properties of fresh placental blood and the effects of storing. In the summary he stresses that the only chemical change of importance due to storing the blood for a fortnight was glycolysis, increasing from day to day. The chief change in the formed elements of the blood consisted in an almost complete disappearance of the granulocytes after the seventh day. In general the erythrocytes were well preserved; some of them showed from the beginning of the second week changes in form due to shrinking (crab-apple form). The chief physiologic function of the erythrocytes, their power to combine oxygen, was preserved. Slight hemolysis appeared after several days of storing. It was insignificant up to the tenth day and almost never amounted to more than 1 per cent (170 mg. per hundred cubic centimeters) of free hemoglobin in the plasma. On the fifteenth day up to 5 per cent (710 mg. per hundred cubic centimeters) of free hemoglobin was sometimes found in the plasma. In these quantities free hemoglobin does not seem to produce any undesirable effect in the recipient.

Sulfapyridine in Lymphopathia Venereum.—Earle has treated twenty-four cases of lymphopathia venereum (venereal lymphogranuloma) with sulfapyridine. The results have been uniformly successful, as is demonstrated by the twelve clinical histories he reports. This series includes most of the types of venereal lymphogranuloma except gross elephantiasis of the vulva and rectal stricture in the male. The optimal therapeutic stage is during the early days of the inguinal adenitis. When fistulas have formed, treatment is prolonged. In the female the best results are obtained during the stage of adenitis, but even in later stages treatment is of value. In two cases rectal stricture was favorably influenced. A feature of treatment of lymphopathia venereum with sulfapyridine which is worthy of trial is the sterilization of female carriers. These often have no obvious clinical signs but invariably show a positive Frei reaction. The treatment of inmates of brothels in tropical ports, who probably form an important focus for the maintenance of lymphopathia venereum, might be of value in reducing the incidence of infection in the male. The most satisfactory dosage of sulfapyridine in this condition appears to be five or six 0.5 Gm. tablets daily for five days. Depending on the response, additional five day courses can be given at intervals of three or four days.

Presse Médicale, Paris

47:1609-1624 (Dec. 13-16) 1939

- Clinical and Pathogenic Study of Dissociated Jaundice. M. Brulé and J. Cottet.—p. 1609.
Treatment of Complicated Fractures on War Front. J. Creysse.—p. 1612.
*Diagnosis of Infectious Mononucleosis: Value of Serologic Reactions. R. Demanche.—p. 1614.

Diagnosis of Infectious Mononucleosis.—Demanche reports his experiences with the serologic test (agglutination reaction) devised by Davidsohn and somewhat modified by the author in 239 cases of true and false infectious mononucleosis. One hundred and forty-seven cases, including angina, acute and myeloid leukemia, Hodgkin's disease, lymphadenia, leukemoid manifestations and other abnormalities could be eliminated as simulating the clinical picture. In nearly all these cases the agglutination titer was low, three fourths not exceeding 1:28. In fifty-seven cases presenting the classic picture the agglutination test was positive. White blood cells varied between 10,000 and 20,000 (on one occasion as high as 28,800). The mononuclear cell count ranged from 50 to 80 per cent. All fifty-seven cases, with the exception of eight, showed a titer evaluation ascending from 1:224. The variations in agglutination did not seem to agree either with the intensity of the disease or with that of the leukocytic reaction but were due in part to the time when the tests were made, that is between the eighth and the fifteenth day, rarely earlier. The disease could be identified even when a low agglutination titer was present by the complete absorption by the beef erythrocytes. The author found that serologic modifications were not discoverable at the beginning of the disease but were always present by the eighth day and had reached their acme between the eighth and the fifteenth day. The agglutinating power of the serum diminished rapidly and fell from more than 1:14,000 and 1:28,000 to 1:112 within the space of two months, simultaneously with the reestablishment of the leukocytic equilibrium. The termination of the reaction was signaled by the disappearance of the typical agglutinations and the return of Forssmann's antibodies. The author found the serologic test clearly and constantly positive in all cases of proved infectious mononucleosis except two doubtful ones.

Revue Neurologique, Paris

72:249-344 (Sept.) 1939

- *Generalized Muscular Hypertrophy of Nursing and Congenital Hypothyroidism. H. Darré, P. Mollaret, Mme. Zagdoun and Mlle. Oelmichen.—p. 249.
Muscular Hypertrophy Without Myotonia in Nursing of 7 Months With General Delay of Development by Congenital Hypothyroidism. G. Bourguignon.—p. 282.
Malignant Development of Royal Tumor in Familial Recklinghausen's Disease. R. Huguenin, S. Burgi and J. Barbet.—p. 287.

Muscular Hypertrophy and Hypothyroidism.—Darré and his associates distinguish three different types of generalized muscular hypertrophy in nurslings which they designate by the names of authors who have described them: (1) the syndrome of Debré-Semelaigne, (2) the syndrome of Cornelia de Lange and (3) Thomsen's disease of nurslings. They report the history of an infant with generalized muscular hypertrophy, which involved even the diaphragmatic, gastric and cardiac muscles. The muscular hypertrophy did not show clinical, mechanical or electrical signs of myotonia; it was without concomitant neurologic signs and was definitely congenital but devoid of hereditary or familial character. On the other hand, the infant presented attributes of congenital myxedema. Thyroid was given, at first without effect; later it became effective in that the muscular hypertrophy as well as the signs of hypothyroidism disappeared. The authors also discuss the three aforementioned types of generalized muscular hypertrophy of nurslings. The syndrome of Debré-Semelaigne is characterized in nurslings by the association of generalized muscular hypertrophy, muscular rigidity, retardation in the intellectual development and a myxedematous syndrome. The amelioration of the thyroid deficiency by organotherapy is followed by improvement in the other symptoms. In nurslings with the syndrome of Cornelia de Lange the following triad concurs: generalized muscular hypertrophy, extrapyramidal hypertonia and mental deficiency. The syndrome of Cornelia de Lange has two symptoms (general muscular hypertrophy and mental deficiency) in common with the syndrome of Debré-Semelaigne; the third symptom, the extrapyramidal disturbance, places it at least

provisionally in a special class. Nevertheless the authors think that intense and prolonged treatment with thyroid is advisable even if the examination of the child fails to disclose signs of hypothyroidism. Regarding the syndrome of Debré-Semelaigne, they say that it is already represented by an appreciable number of cases but that its definition should be more precise and that the term congenital myxedema should be replaced by thyroid insufficiency.

Schweizerische medizinische Wochenschrift, Basel

69: 1217-1240 (Dec. 2) 1939. Partial Index

- *Hypophysial Tuberculosis as Cause of Death. W. Berblinger.—p. 1217.
Traumatic Tetanus and Other Anaerobic Infections. O. Maier.—p. 1220.
Polyradiculoneuritis Guillain-Barré: Case. Anita Saurer.—p. 1222.
Paroxysmal Attacks of Coughing in Adults as Masked Form of Pertussis. M. E. Bircher.—p. 1226.

Hypophysial Tuberculosis as Cause of Death.—Berblinger reports the case of a woman aged 52 who injured the back of her head in a fall. Convulsions and coma set in and she died. The necropsy disclosed extensive atrophy of the entire hypophysis, the weight of which had shrunk to 0.31 Gm., leaving no distinguishable demarcation between the two lobes. Epithelioid cell tubercles with typical giant cells and caseation were found in what remained of the gland. Likewise a bilateral atrophy of the adrenal cortex, especially in the zona fasciculata, was discovered. In the lower lobe of the left lung were subpleural calcifications and small clarified cavities in the apex of the lung with cicatrices in both apexes and healed endocarditis in the aortic valves. There was almost complete absence of pubic and axillary hair. No external signs of occipital contusions were found nor did microscopic inspection of the brain indicate recent softening, scars or hemorrhages. Authentic proof of hypophysial tuberculosis, the author states, can be furnished only by necropsy. In the absence of this the real cause of a patient's death may escape notice. This may account for the fact that only twenty-one cases have been reported.

Clinica Medica Italiana, Milan

70: 473-540 (Nov.-Dec.) 1939. Partial Index

- *Frequency and Significance of Tuberculosis in Rheumatic Fever. M. Pellegrini.—p. 505.
Clinical and Roentgen Aspects of Hypertrophic Gastritis. P. C. Talini and E. Zanetti.—p. 531.

Tuberculosis in Rheumatic Fever.—Pellegrini discusses the frequency and etiologic relations of tuberculosis and rheumatic fever. He made a clinical study of seventy cases of typical rheumatic fever without any symptoms of tuberculosis (either pulmonary or extrapulmonary). The patients were observed during the first acute attack or during a recurrence of the disease. The author found that in thirty-seven cases in the group the repeated x-ray examination of the thorax showed the presence of pleuropulmonary tuberculosis either in evolution or healed. The Mantoux test gave positive results (three plus) in fifteen cases in which pleuropulmonary tuberculosis in evolution was present, in seventeen of twenty-two cases in which there were healed pleuropulmonary tuberculous lesions and in twenty-three of thirty-three cases in which x-ray signs of pleuropulmonary tuberculosis were absent. The author concludes that tuberculosis is frequent in rheumatic fever as an associated infection. The tubercle bacillus is not concerned in the development of rheumatic fever. Mixed tuberculous and rheumatic forms become apparent by predominant (or exclusive) symptoms of either infection. Rheumatic fever has a stimulating action on tuberculous allergy. The stimulation in certain cases results in the development of hyperergic reactions.

Riforma Medica, Naples

55: 1657-1684 (Nov. 25) 1939. Partial Index

- *Roentgen Treatment of Hyperfunction of Thymus (Pende's Syndrome). S. Gualco.—p. 1659.

Roentgen Treatment in Hyperfunction of Thymus.—Gualco observed and followed the behavior of the crisis of the blood and of the basal metabolism in twenty-five adolescents who were suffering from adiposity, genital dystrophy and retarded somatic and mental development from hyperfunction of the thymus (the so-called Pende syndrome). The observations were made before and after administration of roentgen irradiations on the thymus region by Pende's technic, which consists in irradiation of 100 roentgens through a filter of 3 mm. of

aluminum and 0.5 mm. of copper on the thymus region. The irradiations are given every other day, up to a total number of four for each cycle, which is followed by a period of rest for twenty days during which time the patient has no treatment. The complete treatment consists of three cycles of irradiations. The author found that in all cases the somatic genital and mental disturbances are controlled by the treatment. He also found that before administration of the treatment total absolute and relative lymphomonocytosis and neutropenia and moderate disturbances of the basal metabolism exist which are controlled by the treatment.

Archiv für Gewerbepathologie, Berlin

9: 509-606 (Oct. 30) 1939

- Hygienic Aspects of Rock Dust Method Used for Prevention of Coal Dust Explosions. H. Bruns, W. Ceelen and O. Ehrismann.—p. 509.
Results of Examinations of Printers and Helpers Who Work on Machines with Spraying Apparatus. K. Humperdinck.—p. 559.
Experimental Intoxications with Heavy Metals, Thyroid Function and Porphyria. S. Sümege and J. Putnoky.—p. 566.
*Toxicology, Clinical Aspects and Pathologic Anatomy of Nickel Carbonyl Poisoning. O. Bayer.—p. 592.

Nickel Carbonyl Poisoning.—Bayer says that his clinical experience with carbonyl poisoning corresponds with that of Brandes in America and that reported from a refinery in England. He found that in the majority of cases the symptoms disappear in from eight to fourteen days. The pulmonary symptoms increase and lead to a secondary involvement of the heart and the circulation only in the severe cases, and death follows under the signs of cardiac failure. The necropsy is given in two cases. The author concludes that nickel carbonyl acts as an inhalation toxin on the large surface of the respiratory epithelium and produces the aspects of a toxic pneumonia, with simultaneous involvement of all parts of the lung. It is difficult to explain to what extent the frequent cerebral hemorrhages are caused by absorbed nickel carbonyl or to what extent they may be asphyxiation hemorrhages. The pulmonary symptoms in the form of dyspnea, irritative cough and pains along the costal arches dominate the clinical picture. The pathologic anatomic picture is characterized by a peculiar coagulation process in both lungs. Microscopic examination reveals that the pulmonary alveoli are filled with a fibrin precipitate, whereas cellular blood elements are almost completely missing. In the treatment the author obtained favorable results with the intravenous administration of large quantities of dextrose solution and by medication with calcium, strophanthin and circulatory stimulants of the camphor series.

Deutsche medizinische Wochenschrift, Berlin

65: 1621-1648 (Nov. 3) 1939

- "Rheumatic Pains" and Their Treatment. A. Slauch.—p. 1621.
*Granulocytopenia and Vitamin C. H. Kalk.—p. 1624.
Ulcerative Colitis and Anemia. W. Schemensky.—p. 1629.

Granulocytopenia with Vitamin C.—Kalk reports the successful use of ascorbic acid in six cases presenting different disease backgrounds but all characterized by granulocytic deficiency in the leukocytic blood picture. The age of the patients was between 21 and 56 years. The following disease conditions were represented: bilateral glandular swellings of the neck with intrabuccal inflammations and refractory digital lesions of an occupational nature, pyrexia and coma; rheumatism of thirty-five years' standing with icterus, lesions in the scrotum and perineum; dermatitis resembling scarlatina with diarrheal discharges, icterus and stupefaction; chronic polyarthritis rheumatica and signs of myocarditis and endocarditis; bronchopneumonia and thrombosis of the right leg; and lumbago, pains in the upper arms and legs, angina and necrosis at the right palatine arch. The analysis of the white corpuscular blood content disclosed a leukocytic count as low as 2,600 and 3,000, with granulocytopenia at the zero point and lymphocytosis at an elevation of 75 and 92 per cent. Treatment of the patients consisted of intravenous doses of vitamin C varying from 50 mg. to 5 Gm. According to the author, vitamin C therapy, by improving the leukocytic picture, achieved remarkable results and practically saved the life of three patients, besides healing the digital lesions and the inveterate rheumatism. Vitamin C was observed to be capable of causing prompt reactions. In one case reduction of dosage, by administration on alternate days, at once affected the patient unfavorably, whereas restoration to a daily schedule promptly stimulated favorable effects. In spite of the absence or the considerable diminution of granulocytes in the blood stream, the

author classifies his cases among those with a more favorable prognosis because of their relatively high leukocytic count. He regards granulocytopenia as due to delayed maturation or impeded release in the bone marrow. Vitamin C, in his opinion, is prophylactically indicated whenever a disease presents a decrease in leukocytes and granulocytes. He also records the inefficacy of vitamin C therapy in eight cases of myelocytic leukemia, though doses were as high as 1 Gm.

Deutsche Zeitschrift für Chirurgie, Berlin

252: 549-676 (Oct. 24) 1939. Partial Index

- *Biology and Hormonal Diagnosis of Malignant Tumors of Testis. K. Ehrhardt and H. Breitenbach.—p. 549.
Atrophic Chronic Thyroiditis Associated with Bilateral Tuberculosis of the Adrenals with Characteristic Manifestations. A. Jentzer and E. Rutishauser.—p. 567.
*Paget's Deforming Osteodystrophy in Light of Experience of Last Ten Years. W. Brunner.—p. 585.
Cancer Problem. L. Heidenhain.—p. 604.
Petrification of Anatomic Preparations. G. Chiurco.—p. 612.
Dilatation of Biliary Passages. M. Graubau.—p. 614.

Hormonal Diagnosis of Testicular Tumors.—According to Ehrhardt and Breitenbach, an analysis of the urine for the presence of hormones is indicated in every case of testicular disease. A repeatedly positive luteinizing reaction in the urine is diagnostic of a malignant growth of the testis. Diagnostic conclusions are not justified on the basis of a single negative luteinizing reaction. A negative luteinizing reaction and a positive follicle stimulating reaction call for further urinalyses. A repeatedly positive follicle stimulating reaction in the absence of a positive luteinizing reaction is suggestive of a malignant condition of the testis but not decisive. No conclusions are justified on the basis of an occasional positive follicle stimulating reaction. A malignant tumor may be present even though both reactions are negative. Here one must depend entirely on the clinical characteristics of the tumor. A favorable prognosis is indicated when a hitherto positive luteinizing reaction is repeatedly negative after the operations for the removal of the involved testis. The authors suggest that the urine be examined for hormone in every case of gynecomastia because of its frequent association with malignant conditions of the testes. Such examinations would result in recognizing early cases of malignant tumors of the testis. An extragenital chorionepithelioma may give rise to a positive luteinizing reaction in the urine. The authors have reviewed the literature and found that the luteinizing reaction proved positive in the following types of testicular tumor: seminoma, chorionepithelioma, teratoid, carcinoma, dysgerminoma, embryoma and adenocarcinoma. Of the nine cases reported by them, three gave a positive luteinizing reaction. The remaining six gave a positive follicle stimulating and a negative luteinizing reaction. Both reactions were negative in a group of nine cases with inflammatory disease of the epididymis.

Paget's Deforming Osteodystrophy.—According to Brunner, there were twenty-six cases of Paget's osteodystrophy observed in the Clairmont clinic (Zurich) in the last ten years. The majority of the patients were admitted to the clinic because of complications. In 70 per cent the diagnosis was arrived at from x-ray examination. Earliest symptoms were noted between the ages of 31 and 65, on the average at 50 years. Prodromal symptoms lasted as a rule about six years before they were recognized by a physician. The relationship of the incidence in men and in women was as 19:17. Familial incidence was observed in only one instance. Seventy per cent of the patients presented rheumatic complaints, 20 per cent pathologic fractures, while 10 per cent were symptom free. Spontaneous fractures were relatively rare and occurred only in cases exhibiting high grade osteoporosis. There were thirteen fractures of the tibia, nine of the femur and pelvis, seven of the humerus, six of the vertebrae, five of the skull, three of the scapula and the fibula, two of the sternum and rib, one of the tarsal bone and one of a phalanx. They have not observed any cases of circumscribed osteoporosis of the skull. All the traumatic fractures, even those in the advanced age, healed satisfactorily. Bony deformities were caused less frequently by the fractures. They were more frequently due to unilateral increase in the growth and to muscle pull. The roentgenologic observations were as a rule typical; genuine cysts were not observed. Roentgenologically the cases had to be differentiated from Recklinghausen's disease, osteomalacia, osteoplastic carcinomatous metastasis and primary latent

osteomyelitis. The joints did not appear to be involved. Nervous disturbances as the result of bony encroachment at the exits of the nerves or as the result of pressure on the brain were observed relatively seldom. With a single exception the phosphatase blood content was abnormally increased, corresponding to the severity of the disease. The blood calcium level was never abnormally increased and in one half of the cases was found to be at the lower level of the normal. A mild hyperphosphatemia was frequently observed. There was no increase in the excretion of calcium and potassium in the urine. Nephrolithiasis was never observed. The majority of the cases presented neither hereditary nor constitutional etiologic factors. Trauma as a rule exerted an unfavorable influence. The only endocrinologic disturbances were those of a fairly frequently observed increase in basal metabolic rate, suggesting a functional disturbance of the thyroid gland.

Medizinische Klinik, Berlin

35: 1389-1416 (Oct. 27) 1939. Partial Index

- Influence of War Service on Onset, Dissemination and Course of Pulmonary Tuberculosis. O. Schedler.—p. 1389.
Extrarenal Azotemia. H. Reinwein.—p. 1393.
*Differentiation of Gout and Tuberculosis of Joints. R. Kienböck.—p. 1394.
Some Remarks on Dermatitis Herpetiformis Duhring. G. Stümpe.—p. 1399.
Etiology of Erythema Nodosum. F. Bühler.—p. 1401.

Differentiation of Gout and Tuberculosis.—Kienböck says that in general practice chronic articular disturbances are usually diagnosed as one of the following disorders: chronic articular rheumatism, arthritis deformans or gout. He thinks that x-ray examination should be employed more frequently. He describes five cases of painful nodular disorders of the joints of fingers or toes, some of which presented considerable difficulties in the diagnosis especially in the differentiation between true gout and tuberculosis. He admits that the clinical and roentgenologic aspects of these two disorders are similar in some respects. Both are characterized by pains, articular swellings, redness of the skin and formation of fistulas; x-ray examination occasionally reveals cystic destruction of the bone without or almost without increased density of the bone and with small sequestrs and roundish masses. However, there are also some differences: uratic gout is characterized clinically by the well known attacks of pain and by the fact that the fistulas secrete whitish masses, uric acid, which are rarely mixed with pus. The x-ray examination in these cases reveals in the destroyed part of the bone little or no densification; the nodules appear in most cases entirely "light," in rare cases cloudy, secondarily calcified and ossified. Tuberculosis, on the other hand, is characterized by moderate pains; there are no real attacks. The fistulas secrete caseous masses, small sequestrs and pus; some of these fistulas are caseated abscesses. The examination with x-rays discloses densification of the bones, and the attached masses are usually cloudy and occasionally contain small sequestrs. If made with care, x-ray examination usually permits a correct diagnosis. To be sure, errors do occur. One of the cases which the author identified as gout had previously been diagnosed as chondroma of the bone and again as osteitis fibrosa cystica. In some cases even x-ray examination will not permit a differentiation between gout and tuberculosis, and only an operation will clarify the case. It will reveal either uric acid or tuberculous pus, occasionally with bacilli. Examinations of the urine and of the blood are of value if they produce positive results, but they are of no significance if they produce negative results.

Münchener medizinische Wochenschrift, Munich

86: 1549-1572 (Oct. 27) 1939. Partial Index

- Articular Bullet Wounds. G. Magnus.—p. 1549.
*Azosulfamide in Treatment of Cholangitis and Its Experimental Foundation. R. Mancke, K. Plötner and W. Siede.—p. 1550.
Treatment of Epidemic Meningitis with Albuclid (Acetyl Sulfanilamide). R. Fröhlich.—p. 1555.
Interruption of Pregnancy and Sterilization on Basis of Cardiac Indications. F. Lange.—p. 1557.

Azosulfamide in Cholangitis.—Mancke and his associates show that bacteriocholia must be strictly differentiated from biliary infection. Studies in nearly 1,000 cases revealed that bacteria are present in many cases in which infection is absent. After reviewing the bacteriologic aspects of cholangitis and the customary therapeutic methods, they point out that in recent years chemotherapy has assumed great importance from the

standpoint of choleresis and of disinfection. As regards choleresis, the parenteral administration of the pure bile acids signified a considerable advance. However, as regards the possibilities of disinfection of the biliary tract the chemotherapeutic measures still lack a good foundation. Combinations of bile acids with disinfecting agents have been recommended for disinfection, but little is known regarding their elimination and their bactericidal effect. Since derivatives of sulfanilamide have been used in infections with cocci and with organisms of the coli group, and since such infections are often found in the biliary tract, the authors decided to make experimental and clinical studies on the use of azosulfamide. Experiments on dogs with biliary fistulas concerned its elimination. The clinical observations were made on extensive material of a clinic in Leipzig, where azosulfamide has been used in treatment of biliary disorder the last eighteen months. It was administered orally in a dosage of three times 0.6 Gm., usually in combination with hydrochloric acid-pepsin or intramuscularly (from 5 to 10 cc. of a 2.5 per cent solution); or, to intensify the action, these two forms of application were combined for the duration of six days. In combination with the customary dietetic and physical therapy, medication with azosulfamide produced good therapeutic results. In some cases cure was rapid with a critical defervescence. The authors gained the impression that azosulfamide is particularly valuable in cases of inflammatory diseases of the biliary tract which are accompanied by acute symptoms, such as high fever, colic-like pains and more or less pronounced jaundice. The inflammatory symptoms react especially well to azosulfamide. Moreover, the general condition improves rapidly in cases in which the cholangitis has a septic character and is accompanied by chills and malaise. On the other hand, in chronic infections of the biliary tract, azosulfamide produced no improvement.

Problemy Tuberkuleza, Moscow

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Basic Principles in Surgery of Pulmonary Tuberculosis. N. G. Stoyko.—p. 3.

*Complications and Exacerbations Following Thoracoplasty. A. S. Kapushchevskyy and A. G. Kiselev.—p. 10.

Alcoholization of Phrenic Nerve as Method of Treatment of Pulmonary Tuberculosis. G. N. Simenshteyn.—p. 16.

Combination of Phrenico-Exeresis and Cervical Sympathetic Block in Treatment of Pulmonary Tuberculosis. M. M. Alperin and I. E. Kornman.—p. 19.

Treatment of Tuberculous Empyema with Diluted Solution of Sodium Hypochlorite. A. V. Pakhomov, I. A. Shakleyn and E. L. Papsysheva.—p. 23.

Complications Following Thoracoplasty.—According to Kapushchevskyy and Kiselev, the most frequent complications after a thoracoplasty are those involving the pulmonary tissue. They present themselves, as a rule, either as asymptomatic atelectases or atelectatic pneumonias. The authors consider the latter an allergic inflammatory phenomenon caused by the tuberculous virus. Atelectasis, when accompanied by considerable exudate, may resemble a massive pneumopleuritis. The satisfactory condition of the patient, absence of displacement of the heart to the opposite side and rapid absorption of the exudate speak for atelectasis. Postoperative pneumonias resulting from infection of the pulmonary tissues with virulent organisms and not associated with atelectasis is a grave complication. Complications involving the opposite side are rare. Cardiovascular decompensation has not been frequently observed.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

53: 5715-5842 (Dec. 9) 1939. Partial Index

Hemolytic Icterus in Children. E. Gorter.—p. 5719.

Prophylaxis of Infantile Eczema. J. J. Neuteboom.—p. 5723.

Gold in Treatment of Bronchial Asthma. F. Bouman.—p. 5728.

*Chemotherapy of Gonorrhea in the Male. M. K. Polano.—p. 5732.

Hepatic Calculi. B. A. Benavente.—p. 5738.

Chemotherapy of Gonorrhea in the Male.—Polano designates as chemotherapy of gonorrhea the oral or parenteral administration of the derivatives of sulfanilamide. There is no agreement as to which of the different preparations is the most effective in gonorrhea. Of the basis of his experiences and data found in the literature, he concludes that sulfapyridine produces at present the best results. Among fifty male patients who had been infected from three days to several months previous to the onset of the chemotherapy, forty-six were cured by the oral administration of sulfapyridine alone. During the first three days the patients were given daily six tablets of

0.5 Gm. each, then for three days four tablets daily, and finally for three days two tablets daily. In the majority of cases the criterion of cure was that ten provocations be successfully sustained, which consisted of four instillations of 1 per cent solution of silver nitrate, of two prostatic massages and of four bougienages.

Nordisk Medicin, Helsingfors

4: 3501-3562 (Dec. 2) 1939. Partial Index

Hygiea

Case of Pericarditis Due to Penetrating Foreign Body (Fish Bone). S. Wiholm.—p. 3521.

Effect of Cold on Metabolism with Special Regard to Tuberculosis and Diabetes. E. Forsgren.—p. 3523.

Investigations on Crenation of Red Blood Corpuscles. G. Trönberg.—p. 3525.

Case of Congenital Tuberculosis. A. Beskow.—p. 3527.

Contribution to Question of Biologic Effect of Vitamin D. Å. Wilton.—p. 3529.

*Pathogenesis in Venous Thrombosis and Mechanical Prophylaxis. R. Frykholm.—p. 3534.

Pathogenesis of Venous Thrombosis.—Frykholm states that his study of necropsy material comprising twenty-four cases with pulmonary embolism show four sources of beginning thrombosis: the musculature of the calf of the leg, the adductor musculature, the plantar region and the pelvic veins. An ascending thrombus seems to pass from these regions in the direction of the blood stream, while retrograde thrombosing is rare. Early clinical diagnosis of thrombosis requires a thorough examination of these four regions. Veins with varicose distention for a greater extent and thin walls partly collapse during confinement in bed, whereupon intima lies against intima. This occurs particularly in the musculature of the calf of the leg and the adductor muscles, which take the least part in the active movements performed in bed and through which minimal amounts of blood pass. In addition there is mechanical pressure. The veins of the soles of the feet and the pelvis can also be assumed partly to collapse under certain conditions. Normal metabolism of the intima depends on contact with the circulating blood. When two intima layers are pressed against each other, a disturbance in the nutrition of the endothelium can easily occur. This injury of the blood vessel endothelium is considered an important primary condition in the origin of thrombosis. Substances given off by the damaged endothelium and by the thrombus promote coagulation, and the thrombus grows in the direction of the blood stream. In stagnant blood a red thrombus develops, in quickly flowing blood a white thrombus. In mechanical prophylaxis against thrombosis of the lower limbs the author believes that the veins of the lower extremities must, at least periodically, be sufficiently distended with blood and the circulation in the threatened region be sufficiently rapid. Consequently he advocates raising the head of the bed so high that the patient has the feeling of slipping down and is forced to active exercise of the muscles of the calf of the leg and the adductor group.

4: 3563-3636 (Dec. 9) 1939

Hospitaltidende

*Calcinosis Circumscripta: Report of Case with Clinical and Etiologic Considerations. E. Westerlund.—p. 3563.

*Insulin Compared with Histamine as Stimulant for Gastric Secretion. P. Horstmann.—p. 3566.

Calcinosis Circumscripta.—Westerlund reports a case of calcinosis circumscripta in a woman aged 54 with simultaneous Raynaud's disease. The frequent occurrence of the condition in cases of scleroderma and Raynaud's disease is emphasized. The increased calcium content in scleroderma in connection with chronic traumas, when this combination occurs, is assumed to be the cause of the manifestation of calcinosis circumscripta. The question remains, the author says, whether similar conditions prevail in the uncomplicated cases and those complicated with Raynaud's disease.

Insulin Compared with Histamine as Stimulant for Gastric Secretion.—Horstmann tested these two agents in six cases of neurologic or psychiatric disorders, one with normochylia, five with achylia. Fractionate alcohol test meals were given. In all cases insulin was more effective than histamine, and insulin caused secretion of gastric juice where the histamine had no effect. The value of insulin in anxious, depressed patients without appetite is stressed.

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The Patient and the Art of Living

AN APPROACH TO PSYCHOSOMATIC MEDICINE

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The purpose of these lectures is to explore the realm of the so-called affective disorders, especially those states of mental conflict and maladjustment with predominantly physical complaints. I hope we may stimulate in you who are about to go out as practitioners in medicine an interest in this generally neglected and oftentimes unrecognized field.

A London physician¹ discussing the curriculums of medical students said "What they really need to know is the Art of Living. And how is that to be taught?" I have often felt that these patients would never have needed help, would never have been ill, if they had had an ample and wholesome background, a philosophy of life, an established code of conduct to buffer the strains of ordinary life.

In any type of practice one is constantly seeing this class of patient, but for the internist it constitutes a large percentage of his practice. This may be due partly to the fact that having made the rounds of the general practitioners and of specialists who have not looked beyond their limited fields such patients finally come in for a complete diagnostic work-up. In a practice limited to internal medicine, psychoneurosis as a primary or secondary diagnosis may be found to outnumber all others in frequency except the cardiovascular diseases and the endocrine disorders. It occurs as frequently as gastrointestinal disturbances. It is considerably more common than the pneumonias or blood dyscrasias.

This is a situation that often stuns and baffles the young practitioner making his first contact with private practice. At school and even in the teaching hospital he has mechanized his study of the patient. Physiologically, anatomically and even pathologically he has been dealing with a fairly definite science. In the study of patients, routine questions are asked regarding

subjective symptoms, physical signs are elicited and laboratory investigations galore are made; then the results are tabulated and correlated much as an engineer would work with his slide rule, and a definite diagnosis is established. Treatment is almost as routine, and one has a glow of satisfaction over one's workmanlike technic. When the physical and laboratory observations fail to fit the subjective symptoms the patient is dismissed with a blithe "Well, we can find nothing wrong with you" and the diagnosis is filed as "No disease found." But there is something wrong, there is something wrong or these people would not be appealing for help, and the private practitioner cannot so blithely dismiss the sufferer who has come to him for help.

THE PROPER APPROACH

Psychosomatic disease may be defined as a condition in which the chief complaint is usually physical, the subjective symptoms are usually out of all proportion to the physical findings, and there is always an underlying and often obscure mental or psychic disorder based on a constitutional inadequacy and on some environmental or circumstantial conflict.

In organic disease the symptoms are clearcut and are apt to be minimized by the patient. In the affective disorders the complaints seem to spread out like the waves on a pool of water into which a stone has been thrown, where though the primary disturbance is really slight the turmoil of the waters is great. Nevertheless these somatic manifestations are due to some real functional or mild organic disorder. They are not imaginary. True, the patient's threshold to pain and discomfort is lowered or he compensates poorly for his disability. But where there is a physical complaint there is an underlying physical defect that needs attention. Incidentally the patient who is having neurogenic but nevertheless very real abdominal distress may rightly be much dissatisfied with the medical opinion that because the gastrointestinal

From the Department of Medicine, University of Southern California School of Medicine. Lectures to the Medical Students under a fund established by Mrs. Clark M. Cavenee.

1. Banister, Harry: *Psychology and Health*, New York, Macmillan Company, 1935, p. vii.

series and other investigations are negative there is nothing wrong with him. In fact the somatic complaints offer an opportunity to the physician to give the patient relief and thereby win his confidence and trust much more effectively than psychotherapy alone could ever do.

It is unfortunate that in the mind of the layman there is a stigma attached to mental disorders, but he does resent being told that his trouble is all "nerves" and resents being sent to a physician who treats only "nerves." The neurasthenic patient seldom consults his doctor for nervousness but rather for indigestion or palpitation of the heart or for some other physical ailment, and he is more interested in the relief of these symptoms than in diagnosis. A patient who had had severe headaches all her life once told me that because there was nothing organically wrong with her she had been referred to a psychiatrist, that she had been psychoanalyzed and had been told that she was a Peter Pan type of individual, that she would have been all right if she could have remained a child and that it was a mistake for her to have assumed the strain and obligations of married life and motherhood. "Well," she said, "That may be true, but what am I going to do about it now? I still have headaches."

I do not wish to minimize the help that may be rendered by psychiatric consultation and advice but what is needed in the attending physician is not a highly specialized knowledge of psychiatry or of any other of the specialties but rather a breadth of medical vision and skill that will enable him to make the patient comfortable. In addition he must have a large fund of patience and compassion and common sense so that he can establish contact with the patient and win his confidence. The proper approach to these cases might, therefore, be said to be one-third psychiatric, one-third physical and one-third compassionate guidance in the Art of Living.

WHY THEY SEEK RELIEF

With somatic complaints looming large in the patient's consciousness and with the treatment of these physical ailments so important, what then are the disorders for which the psychoneurotic person seeks relief? By far the largest number (37 per cent of a series of 250 cases studied) complain primarily of gastrointestinal disturbances. Although positive and often severe, the symptoms usually fail to fit any established pattern. Quite typical are postprandial bloating and distention, intestinal gas with eructation and flatus, migratory and ill defined pains, constipation often alternating with diarrhea, and most characteristic of all a real or alleged idiosyncrasy for many common foods. Gastrointestinal roentgenograms in these cases are negative except for evidence sometimes of disorders of motility and peristalsis,

and gastric analysis reveals no disturbances of gastric acidity or rate of secretion. This is important to remember in treatment where belladonna and its derivatives are usually indicated but where alkalis so commonly given for nervous indigestion are not. In fact, the giving of alkalis may aggravate an already existing alkalosis of nervous origin.

Second in order of frequency are cardiovascular symptoms (a primary complaint in 17 per cent of the series). In these cases there is palpitation, irregularity due to premature contractions, and precordial pain usually described as either a constant mild ache or as a sharp sticking or pricking sensation not related to exertion. This pain is utterly unlike the pain of coronary disease with its squeezing substernal oppression or its severe knifelike stabbing pain through the precordium or radiating to the arm. Patients with neurogenic heart disease always claim to be short of breath on exertion, but this is obviously not a true dyspnea. Not infrequently this type of patient has been told by some casual physician that he or she had a "weak heart" and has taken digitalis. This is tragic, because the patient becomes heart conscious and a cardiac neurasthenic. It is so much easier to convince patients that there is something wrong than that there is nothing wrong. Examination of these individuals often shows poor reaction of pulse and blood pressure to change of position and exercise but essentially negative electrocardiographic manifestations. The trouble is obviously due to sympathetic nervous system imbalance and calls for sedation, regular graduated exercise, and reassurance in large doses.

The psychoneurotic patient seldom limits his symptoms to one bodily system. In fact it is quite characteristic that in giving his history the psychoneurotic individual seems to be a jangling mess of dysfunctioning organs. Questions directed at the nose and throat, the eyes and ears, the cardiovascular system, the lungs, the gastrointestinal system, the genito-urinary system and so on throughout all monotonously reveal some complaint.

The general complaint of malaise and fatigability is most common (a primary complaint in 14 per cent of the cases). It is characteristic that this is malaise rather than fatigability. The patient is tired when he wakes up, tired and ambitionless during the day, and tired when he goes to bed at night. Yet when called on for something that has to be done he somehow forgets himself and musters the strength to do it. This symptom is a source of worry to the examining physician and of expense to the patient because of its suggestiveness in differential diagnosis. One must consider and rule out anemia, hypothyroidism, hidden cancer, masked renal disease with toxic symptoms, tox-

emia from hidden foci of infection, myasthenia gravis, hypoglycemia, early Addison's disease, tuberculosis and, of course, syphilis in one of its bizarre manifestations. Malaise is a trouble making symptom because it is essentially mental and not physical in origin. It is a protective mechanism against the demands of the World. But it can be labeled neurogenic in origin only by a system of elimination. In its specific treatment mild sedation often accomplishes more than stimulation, although a morning dose of amphetamine sulfate often seems indicated.

"Aches and pains" was the primary complaint in 10 per cent of the cases as well as a secondary complaint in most of the others. This may take the form of a general myositis or of definite backache, headache or neuritis. The symptoms are often so vague that one wonders if they are real, but so persistent that one is forced to conclude that they are due to toxemia, possibly gastrointestinal in origin or due to neurovascular disturbances. Massage and physical therapy often bring welcome relief in these cases. This is the type of symptom which is apt to make the patient the slave of the medicine bottle or of many bottles, especially if the hurried and distraught physician reaches for his prescription pad at the recital of each new ache. Better perhaps to mix a little tolerance for discomfort with some of the medication.

MENOPAUSAL SYMPTOMS

The next group (7 per cent of the series) is of considerable interest and more gratifying to work with because specific treatment yields such encouraging results. This is the group with menopausal symptoms. The symptom complex is one that is almost classic in its uniformity. There is malaise and yet restlessness. There is an occipitocervical neuralgic "headache." There are vasomotor disturbances manifesting themselves as "hot flashes" and excessive perspiration—a perspiration started by excitement rather than by exertion. There is often palpitation of the heart and sometimes irregularities due to extrasystoles. Intestinal indigestion is not an uncommon complaint. Changes in the character and regularity of the menses is usual. And finally there is arthritis of the menopause, probably secondary to vasomotor dysfunction. This arthritis typically affects first the knees and the proximal phalangeal joints. The patient complains of some pain and stiffness in going up stairs and of stiffness and swelling of the fingers. The swelling, when it occurs, is due to periarticular tissue edema. X-ray examination, which is at first entirely negative, will later typically show degeneration of the synovial membrane and of the end of the bones, and hypertrophic lipping of the joint margins. These symptoms are presumably due to endocrine dysfunction and the treatment is specific—the

administration of estrogenic substance, preferably parenterally, and of thyroid if it is indicated or tolerated. Treatment of the condition is otherwise symptomatic such as mild sedation, atropine for the hyperhidrosis, and dietary restriction for the indigestion. The psychoneurotic state so often accompanying the menopause is not to my mind an endocrine born disorder. It is undoubtedly caused or aggravated by the somatic complaints; but of its real basis I shall treat later.

It is not uncommon for otolaryngologists to see the psychoneurotic first (5 per cent of this series referred the trouble primarily to the nose and throat). The complaint is usually of a soreness or aching in the throat or of nasal symptoms in spite of a grossly negative physical examination. In the differential diagnosis a masked infection with Vincent's spirochete must be kept in mind, and there are cases of peridental Vincent's invasion without the usual ulceromembranous lesion, when a sore and aching throat normal in appearance is the only sign.² However there are many cases for which there seems to be no physical basis and which must be labeled as purely neurogenic in origin.

There is very definitely an arthritis that is typical of the psychoneurotic state. It is hypertrophic in type and although chronic in its course is subject to more variation than the usual hypertrophic arthritis of old age. The treatment other than that aimed at the psychic background is as it would be for the other arthritides. Arthritis was the primary complaint in 4 per cent of our series.

Strangely enough, genito-urinary complaints seem rare as the outstanding symptom (3 per cent). Even neuroses based on sexual maladjustment manifest themselves first elsewhere in the body. Cutaneous lesions, especially pruritus, occur occasionally, as does low grade fever. The neurogenic fever is a constant source of worry to the attending physician because of the fact that, although every possible cause of fever has been investigated and discarded, one always fears that something has been overlooked. However, in spite of this apprehension and of a desire to follow the daily temperature curve as a stock broker might follow the ticker tape, it is usually advisable to have the patient throw away his thermometer and forget his fever.

TAKING THE HISTORY

In the taking of the history, the recital of the physical ailments usually rushes on in an unending stream, the patient often somewhat petulantly brushing aside any attempt on the part of the examiner to direct his recital into any well ordered plan or description of any recognized symptom complex. Yet of the psychic factors

2. Barrow, W. H.: Systemic Reaction to Oral Fusospirochetosis Without Local Lesions, *Ann. Int. Med.* 12: 508 (Oct.) 1938.

he usually says nothing until subtly pressed for information. How, therefore, is this so important information to be elicited and when? It is essential that the past and present life of the patient be reconstructed. Leading questions are asked and hints of conflict or maladjustment are followed up as tangents from the main line of questioning as they arise. "Where did you live as a child? What did your father do? Were you comfortably provided for? Was your home life happy? Did you enjoy school?" Answers to these personal and pertinent questions elicited in a sympathetic and tactful way will often reveal a faulty background which partially explains the present mental state. "What did you do after you left school? Did you enjoy your work?" The wistful eagerness with which this last question is often answered in the affirmative is illuminating and pathetic. "Where did you meet your present husband? What is he like and what does he do? What does your immediate family consist of, that is, who constitute your household?" In-laws who may be the unconsciously irritating factors often reveal themselves here. "Do you do your own housework? What time do you get up in the morning? What do you do after breakfast—and after lunch? Do you find time for outside interests? Do you take any exercise? Have you any real hobbies?"

BALANCING THE BOOKS

After delving into the lives of patients, one is impressed with how poorly most individuals plan their lives for pleasure, for the use of their leisure hours. Yet when we balance our books at the end of life the two questions that it would seem must sum things up are "What have you accomplished and more important still how much fun have you had—how much enjoyment?" Often then in getting an answer to the questions "What do you do with your leisure time and what are your hobbies" one runs on a gold mine of information—thwarted desires, inhibitions, aimless and restless efforts at escape, or stolid resignation and lack of interest—the depth of the patient's background. In fact, I often think that from the answer to this question I can then and there make a prognosis. I am given a hint as to quality and quantity of the material with which I have to work. And so the patient's portrait begins to unfold. "What do you do with yourself evenings? Do you have many friends? Do you enjoy seeing them? Do you get out to parties and dances and other forms of entertainment as much as you would like to?" Here sometimes for the first time one uncovers evidence of marital incompatibility or of maladjustment to marriage. The husband comes home tired and wants to read the paper and go to bed. The wife, anxious for escape from her oppressive "four walls," would like to do otherwise—or perhaps both husband and

wife, chafing at the bit, are tied down by children who cannot be left alone.

Detailed questioning with regard to sexual relationships are, of course, of great importance and fortunately, as the result of public education in these matters, such questions are not only not resented but are welcomed as an opportunity to discuss problems the patient has long wanted to discuss or at least to satisfy some natural curiosity. And again as tangents from this angle one often obtains an illuminating glimpse of some unsuspected character complex. I do not, however, believe that from the point of view of practical psychology most or even many mental problems can be laid at the door of sexual repression.

In spite of or perhaps because of the intimate nature of these questions, it seems advisable to get this information at the time of the first visit. The patient is then usually in a mood to tell his whole story, his feelings toward the physician are purely impersonal, and there is therefore apt to be less reticence than there would be later on; and perhaps most important of all at this time the patient has not yet centered his attention on the treatment and progress of his physical ailments.

This type of questioning is not a very searching psychiatric examination. In fact it is not in one sense psychiatric at all. It merely constitutes an effort on the part of the examiner to reconstruct the patient's background and environment, to get a true picture of him as a human being and not as merely a physiologic and pathologic machine. Francis Peabody³ in his monograph on "The Care of the Patient" said that "what is spoken of as a clinical picture is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relatives, his friends, his joys, sorrows, hopes and fears. . . . Everybody, sick or well, is affected in one way or another, consciously or subconsciously, by the material and spiritual forces that bear on his life, and especially to the sick such forces may act as powerful stimulants and depressants. . . . In all of your patients whose symptoms are of functional origin the whole problem of diagnosis and treatment depends on your insight into the patient's character and personal life, and in every case of organic disease there are complex interactions between the pathological processes and the intellectual processes which you must appreciate and consider if you would be a wise clinician."

THE UNDERLYING FACTOR

We have then reviewed the long list of somatic complaints, those outward physical signs of an inward spiritual restlessness, which bring the patient to the doctor's office, and we have by

3. Peabody, Francis W.: *Doctor and Patient*, New York, Macmillan Company, 1930, pp. 27-57.

patient questioning and sympathetic listening constructed the patient's background and environment and his reactive processes. What now in this typical psychoneurotic group are the underlying psychopathic factors? About 75 per cent of the patients are women and the problems are therefore predominantly feminine problems. Men are more apt to recognize the underlying maladjustment or mental conflict as a cause of the trouble and either meet the issue or rationalize their feelings. Recognizing the cause as psychic, the man is also less apt to seek medical advice than is his wife for her supposedly physical complaints. Furthermore, with his work and his greater freedom he is able to compensate better for the lack of mental harmony.

Among the men the anxiety states and depressive neuroses account for about 40 per cent of the cases, while only 12 per cent of the women will be found to fall in this group. Without a psychoanalytic survey one is seldom able to find a cause for these usually severe and well established neuroses. The difficulty is that we are dealing with a personality, with a mental state, that has become pretty well fixed. The anxiety state may often be traced to childhood environment or experiences, even to anxieties never consciously experienced; but the emotional state has been "displaced" from the original object and transferred to other objects, or anxiety has in fact become a habit of thought. Thus, for example, the child whose tranquillity and security have been threatened by marital discord of the parents grows up into a person surrounded with thick banks of gloom who, although he recognizes that he is no longer dependent on his parents for happiness and security, still approaches each new episode of life with fear. To treat these individuals properly, one must completely rebuild the personality, a task calling for a skilful psychiatrist.

INADEQUATE EQUIPMENT

About the same percentage of the male cases and about half of the females will fall in that large group characterized as being constitutionally inadequate. A few of these by careful psychiatric study could probably be more accurately classified, but most of them seem simply to belong to that group with inadequate equipment to meet and handle the problems of everyday life. The trouble may often be traced back to hereditary instability, to poor childhood environment or to early psychic trauma, but in any event the adult psyche is a weak vessel. One might well say that these patients are like boats which are safe and comfortable as long as they stay in the sheltered waters of a harbor but which will founder if subjected to the buffeting of even an ordinary sea outside. It is this type of man who was "shell shocked" in the World War (as the term was then loosely used). In this group we find the woman for whom the

ordinary obligations of married life are too great a burden and who often escapes to her physical ailments as a subconscious excuse for her failure to "make good." It is this type of patient in whom the will to get well is often feeble because health means again going out into a world that is already too great a challenge, whereas illness is a not uncomfortable refuge.

Many of these states may also be traced to childhood. It is Adler's belief that all psychoneuroses are based on some phase of an individual's expression of his ego, in a striving for power. Thwarting of this instinct then in the formative years may be the basis for the present trouble. Frustration breeds lack of confidence and a noncooperative mental state. On the other hand, too great coddling is detrimental and many adult neuroses can be traced to lack of mental discipline. It is to be hoped that our advocates of progressive education will not let their enthusiasm carry the movement so far as to remove all the drudgery from school work. There is great virtue in doing well an unpleasant and uninteresting task, the only rewards for which are the escape from a penalty and a satisfaction with a job well done—again an expression of power.

THOSE WHO NEVER GROW UP

In this group of constitutionally inadequate individuals are those who never grow up. These people with their ingenuousness and childlike ways are often most attractive but they are awfully hard to live with. After all, there is not a Santa Claus and the dolls of the nursery do not present the problems real children do. One must in adult life face and adjust oneself to reality. This these individuals usually fail to do. In this group one finds most alcoholic and drug addicts, those who seek the comforting anesthesia of alcohol or drugs to escape from a reality they would not face. In fact in this group we find, I think, most of the disagreeable and pathetic individuals of society—introverts retreating from an alien world, nagging women and fault finding men, showing in their attitudes evidence of a transference of disappointment and hatred because of thwarted desires and ambitions, reformers who finding themselves too small or too helpless in an unfriendly world try to make it over to fit themselves. Many mental states can therefore be explained on the very simple basis of this constitutional inadequacy.

In the performance of the physical tasks called for in our daily routine we expect to have the necessary strength and reserve to accomplish them. The normal youth expects and enjoys the physical training and exertion to make this possible and is ashamed to be called a physical weakling. Our daily routine calls also for mental stamina and reserve. If

these have not been developed we cannot meet the demands made on us and we not only fail but create within ourselves a mental complex as we struggle with our inadequacy.

A large number of women and a smaller number of the men (24 per cent and 8 per cent respectively in the series studied) have neuroses based on maladjustment to marital and home life. It is with considerable temerity that I approach the subject of marriage, but as one reviews intimately the details of this relationship in the lives of patients and of friends one cannot but reach the conclusion that American marriage often results in some bizarre situations. The sexual instinct, the desire for a mate, is simple, fundamental and primitive. But marriage instead of being the solution of a social and individual problem actually creates problems where none existed before—and this is true even where such obvious harassments as family dissension, financial worries, differences of social and educational background, and clashes of personality are nonexistent. It is pertinent to point out the factors that are so often causes of mental conflict and maladjustment.

THE PLEDGE AT MARRIAGE

In the first place the pledge at the time of marriage with its "till death do us part" is too irrevocable in spirit. In spite of the ease of divorce, an individual with a highly developed conscience or with a high sense of consideration for others (the type of individual that gets into mental quagmires), this type of person has a strong feeling of marital obligation and will not desert even an unworthy mate. On the other hand the unworthy mate often makes up her mind that she is not going to be deserted and creates a situation that is most difficult of solution. From the medical point of view, divorce as an escape from an aggravating situation should be not only legally easy and fair but also without social stigma.

In addition to the finality of marriage, which mentally depresses many individuals, there is often demanded a complete submergence of personality which obliterates them as individuals. The I becomes We. Old friends are lost, old associations, even old habits, are given up in the interest of marriage. In other words, the individual is made over to fit the relationship instead of the individual finding a relationship that fits him—a situation calling for adjustments which are often the cause of mental conflict. In women the failure to find in marriage the emotional outlet that was expected, the realization that marriage is a business and social partnership rather than an adventure in romance, often results in a repression neurosis. In men, on the other hand, the domination and surveillance by their wives, more complete than anything experienced under parental supervision, breeds a conflict with instinctive desires

that sometimes results in periodic debauchery, in alcoholism or in some other form of psychic escape. The actions of American men at a convention away from home and without their wives are pathetic evidence of the restraints and inhibitions under which they regularly live.

A PARADOXICAL SITUATION

Not only may marital conflict cause somatic disorders but the converse is also true. The possibility of chronic ill health in one's partner may in accordance with the marriage vows be accepted as part of the contract, but it may also result in frustration and resentment. Another source of maladjustment is seen in women who prior to marriage have held responsible and interesting positions and who after marriage find themselves alone and idle most of the day or at best engaged in petty household routine.

In short, from the psychiatric point of view the problems of marriage are problems of the emotions or of the conflict of the emotions with experience. Furthermore, it seems that those who emotionally need marriage the most, those whose intensity of feeling calls for such outlet, are the individuals most likely to present these problems. The cause of this paradoxical situation lies, I believe, in a misconception of the place of marriage in the psychic pattern.

Sentiments may be said to be "organizations of the instinctive tendencies and consequently of the emotions around various objects." There is a need in life for a dominant central sentiment, "a star to hitch one's wagon to." This central sentiment should be invulnerably entrenched within oneself. The integrity of marriage is anything but invulnerable, its fate is shared between two individuals. Marriage should be a means to an end instead of an end in itself. It cannot be the basis for a satisfactory dominant central sentiment. If all of this were recognized, if marriage and the sentiments built around marriage were only subordinated to more stable instruments, if in other words marriage demanded less of its victims and less were demanded of it, it would fit better into our psychic pattern.

Although in a larger sense all marriage problems are sexual problems, physical sexual incompatibility as a cause of affective disorders is relatively unimportant. In women loss of libido or actual frigidity is often a symptom of a psychologic conflict. Sexual habits and reactions should be studied in each case and the cause of abnormalities determined if possible. It should be remembered that impotence in the male and frigidity in the female are practically always psychic rather than physical in origin. For this reason they are most difficult to handle and after a psychoanalytic house cleaning glandular therapy, for its suggestive as well as for its actual endocrine replacement value, is indicated.

One hears much of the problem of sex inhibitions in the unmarried. I feel that it is an over-emphasized problem. In the first place there is in these days more sexual freedom in the single state than there is for those under the restraint of marriage. In the second place it is perfectly possible for a person to get along without sexual intercourse if he has some other interests in life and if overzealous friends will refrain from meddling in his love life. Much unhappiness and sexual unrest are caused by our American overemphasis on sex. We are the most sex-conscious people in the world, and what should be instinctive and emotionally spontaneous becomes an artificially produced obsession. In spite of this, sex problems and in fact problems of any sort are less common among the unmarried than among the married.

BUSINESS WORRIES

Of greater significance among psychoneurotic men than marriage and sex is business. (Worry or dissatisfaction in business will account for about 25 per cent of the cases.) The changing social order has created troublous economic situations which are causing more unhappiness than did the old order which they are trying to change. It should be remembered that in these cases it is not long hours and hard work that cause the mental perturbation but rather the factors of fear and uncertainty and indecision which nag at the individual and interfere with his normal mental rhythm. As in marriage, there is sometimes the factor of frustration and disillusionment as a man finds his way to achievement blocked or the validity of his ideals questioned. There are, of course, only two solutions to the problem, and from the psychiatric point of view it is immaterial which road is taken. The patient must adjust himself to his environment, accept the inevitable or get into another line of work.

It is of interest that grief, such as over the loss of husband or child or over some family calamity, accounts for the disturbed mental state in some of the women (8 per cent) but in men is rare as a neurogenic factor. The grief complex is, of course, simply a lack of adjustment to a loss, sometimes due to a pitiful lack of other sentiments and interests, and sometimes to a morose enjoyment of the emotion of sorrow or of the sympathy that comes in its train.

Two other etiologic factors apt to be seen exclusively in women are conflicts due to family complications (other than marital) and nervous exhaustion due to mental and physical trauma. Because there is so little that can be done for these groups in a remedial way, it is fortunate that the two classes are small. Filial obligations are often a depressing problem, but as long as one has a conscience there is no escape; as for trauma, it leaves scars that cannot be obliterated.

The menopause is blamed for many of the depressive neuroses and in this woman has no monopoly. A male menopause, with mental and physical symptoms, is now described. As stated before, I do not believe this is endocrine in origin except that the somatic symptoms due to the endocrine dysfunction are aggravating factors in precipitating a mental breakdown. Sometimes there is a constitutional instability and inadequacy which will not stand the strain of any increased physical burden. Also it seems that often with the approach of the menopause the woman realizes keenly the end of her reproductive period and the approach of old age, in which because of menopausal symptoms the infirmities of age are emphasized. In balancing the books she realizes that the romance of childhood, young womanhood and motherhood is over. Often she has nothing left but the companionship of an aging and often unfaithful spouse and she feels the world closing in around her. In the neuroses and hysterias of this period of life in both men and women, one is reminded of the final struggle of the fish before being gathered into the net. It is my impression that this psychoneurosis of the menopause is much more common in married than in single women, though both, of course, have the physical symptoms. Fortunately this is usually a passing phase. In the normal individual, mental adjustments are made and middle and old age may prove to be the most serene and happy periods of life.

CASE HISTORIES

A few case histories will illustrate the neurogenic backgrounds I have been discussing and will help visualize and emphasize the problems:

As an example of the anxiety neuroses there is the case of a young Jew, manager of a small store. He consulted a physician because of chronic indigestion from which he had suffered for years. The manifestation of this had been heartburn, eructation of gas, bloating and constipation. Several weeks before coming in he had fainted several times in one evening and on three occasions since that time. At other times he had chills which had lasted from fifteen to thirty minutes. There had also recently been considerable dizziness. It developed that he had been under medical observation on numerous occasions and that all investigations, including gastrointestinal roentgenograms, had been negative except for evidence of a hypermotility of the intestinal tract. Cutaneous tests had revealed sensitivity to several foods, but elimination of these foods from his diet had failed to give any relief. A gastric analysis, electrocardiogram and basal metabolic rating had all been negative. This young man was found to work long and hard at his business, he took no exercise and he had no hobbies. He roomed with two business associates and said that their conversation in their off hours was largely about their business. A repetition of the gastrointestinal studies and of the other laboratory procedures failed to reveal evidence of any organic disease. He was given symptomatic treatment and obtained enough relief to warrant his returning every few days for adjustment of his routine. What this individual needed, of course, was a complete change of personality with a resulting interest in activities, both physical and

mental, outside of his job, and better balance in his application to his work.

Another case of the same type was that of a 35 year old seaman who complained of nervousness, arthritic pains, a postnasal discharge, indigestion, and worry over the firmness of an old hernial scar. A number of years before he had had a gonorrhea, which had apparently been thoroughly and effectively treated, and at another time he had been told that he had tuberculosis. In spite of repeatedly negative physical examinations he worried a great deal about both of these possible conditions. His mental state was further disturbed by a recent marriage and subsequent separation. He was advised to try to forget his physical symptoms, to settle his marital mixup, to seek a change of work and environment and finally, in the event of the need for medical attention, to seek the services of a psychiatrist rather than of a urologist.

The 38 year old wife of a government official, with her many symptoms and negative physical examinations, is a good example of the tremendous amount of ground that can be covered in a thorough study of one of these cases. When first seen her complaints were malaise and fatigability, anorexia, nausea and vague abdominal distress. She related that this was a recurrence of a symptom complex which had occurred several times previously and that complete examinations at each time had failed to reveal any organic disease. While she was under observation there were a number of interesting clinical episodes. She intermittently had an afternoon elevation of temperature, there was at times a severe neuralgic pain in the upper part of the back, at other times there was an unexplained discomfort between the costal margin and the crest of the ilium on the right side, at another time she developed a temporomandibular synovitis, later she developed a severe urticarial rash accompanied by an axillary and inguinal adenitis which was unexplained and which subsided spontaneously, and intermittently she had a "black tongue." Hers was one of the case which always keeps the attending physician worrying over the possibility of missing some hidden condition, particularly in view of the fact that there was never any demonstrable psychopathic factor which could explain her condition on a neurogenic basis. She was happily married, there were no financial worries, and she often made the statement that she had everything to live for and desired nothing as much as she desired getting well so that she could enjoy life. The patient was studied from every possible angle, and almost every known test was carried out on her in order to rule out possibilities in differential diagnosis. She has been treated by various physicians, both as an ambulatory patient and in sanatoriums, and is now in a mental hospital with an established diagnosis of constitutional inadequacy. One of the psychiatrists who had had her under observation for some time explains her mental condition on this basis: Her premarital life was unsatisfactory and somewhat unhappy. She rather pictured married life as an ideal state where she would be relieved of all disagreeable responsibilities and distasteful duties, but as time passed and she failed to realize these expectations her unformulated and unconscious hopes began to fall down about her, leading at first to anxiety and later to depression. He pointed out that behind all this, of course, is a lack of training and preparation for normal living which left her with a rather infantile personality.

In the 32 year old wife of an automobile salesman, we see an example of the vague somatic complaints that may be traced to marital incompatibility. She first consulted me with a complaint of periods of lassitude which she had had intermittently since the birth of her first child two and one-half years before, the condition being worse since the birth of the second child three months before. She suspected that

her trouble might be due to hypothyroidism, for which she had been treated in the past, and a basal metabolic test revealed a rate of minus 19. Thyroid medication, however, failed to relieve her symptoms. It was rather typical of this woman that although she was in essentially good health and had before her marriage been active in sports she now took no exercise, had no hobbies and was inactive socially, although she said she still was gregarious in her tendencies. In other words, she seemed to have lost all ambition and interest in life. Advice with regard to the need for exercise and a general change in her habits brought no results and finally in a discussion of sexual relationships where she admitted loss of libido she stated frankly that she had never really been in love with her husband and was now bored with him and with married life. Divorce was discussed quite frankly with both the patient and her husband, and it is interesting that, although no definite step was taken in this direction, dragging the problem out into the open and offering a way out was in itself enough to bring at least partial relief from the somatic complaints.

A young woman who had been married for only one year was referred to us by her mother because of malaise and loss of weight. She had no other complaints and her physical examination was entirely negative. It was only on the third visit and after considerable insistence on the part of the examiner that she admitted unhappiness in her marriage due to financial and social restrictions. On the next visit and after further questioning it developed that her marriage had been precipitated because of a supposed pregnancy and that she really wished to escape from a situation into which she had been forced. As in the preceding case, as soon as a solution of the problem was presented in the form of separation and subsequent divorce the patient was relieved of her malaise and immediately started to regain the lost weight.

That psychoneurosis does not always result in loss of weight is shown by the case of a woman of 48 who consulted me primarily because of overweight. Except for a mild indigestion there were no other complaints until at a later date the patient said that she had for some time felt "bad all over," and the husband revealed a background of considerable marital incompatibility and worry over finances. It is possible that overeating either as a manifestation of nervous instability or as an effort to satisfy an unexplained craving may be a not infrequent manifestation of psychoneurosis.

A housewife of 27, in very moderate circumstances, was seen one night complaining of severe pain in the right lower quadrant with diarrhea and vomiting. She had had several similar attacks during the previous nine months. There was a slight elevation of temperature and there was sufficient tenderness and spasm in the right lower quadrant to justify an appendectomy, in spite of a normal white count. The appendix, however, was obviously not the cause of the trouble and a small ovarian cyst, which might have been causing some discomfort, was removed. This patient had a normal convalescence but on the day that she was discharged to her home she had a nervous chill and again a slight elevation of temperature. Over the succeeding several weeks there were recurrent attacks of nausea accompanied by nervousness, tremor and chilling. On intensive questioning it was revealed that besides her own children she had a stepson who had recently come to live with them. He was epileptic and apparently also had some mental deterioration which had resulted in a fear of him by the patient and dreams at night about the boy's attacks. I felt, of course, that this woman had had an unnecessary operation which might have been avoided if beforehand more could have been known about the family situation.

A not unattractive Jewess of 39 was referred to me for a heart examination because of symptoms of palpi-

tation with exertion and excitement, shortness of breath with exertion, precordial pain, and occasional spells of faintness. Other somatic complaints were a pain in the right flank and back, intestinal indigestion, and a mild productive morning cough. A cardiovascular examination, including an electrocardiogram, was entirely negative. The woman was the wife of the proprietor of a store in which, up to two years before, she had worked as a cashier, at which time she had had a nervous breakdown. Her present attack had been preceded by hard work at the store, worry over the building of a home, and some conflict over some of her husband's family. She volunteered the information that before marriage she had lived in a large Eastern city where she had been in charge of a show room in a woman's clothing store with thirty models under her and where there was always laughter and life and activity. Marriage had meant for her giving this all up, because at first her husband objected to her working and she was left sitting alone all day in an apartment twiddling her thumbs and smoking cigarets. The greatest excitement of the day was going out to dinner with her husband. Here, of course, is an example of a woman who did not have sufficient background to build a life of her own, who was unable to adjust herself to marriage, and who was annoyed and disturbed by the nagging pettiness of the life she was forced to lead. Such mental conflict and maladjustment resulted in sympathetic nervous system instability, which of course explained all of the somatic complaints.

It is quite obvious that, quoting again from Francis Peabody, "What is spoken of as a clinical picture is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relatives, his friends, his joys, sorrows, hopes and fears."

TREATMENT

Somatic complaints—indigestion, cardiovascular disorders, malaise, neuralgia and the rest—originate in the psychoneuroses usually through disturbance of the so appropriately called sympathetic nervous system. And, conversely, in some instances a minor physical disorder dragging on an unstable nervous system precipitates a psychoneurosis. In either event patient and sympathetic treatment of these physical disorders is most essential. It is apropos to say here that, in the handling of these cases from both the mental and the physical angle, it is necessary that time be given generously to each patient. I am reminded of the anecdote of one of our great clinicians who was seeing a case in consultation in a small town near Baltimore. One of the doctors with him whispered that if he hurried he could catch a certain train back to the city. The consultant replied that they could afford to miss the train but that above all things they could not afford to be in a hurry.

This is certainly the attitude that one must take in attempting to treat these contrary and difficult cases, and in addition to this there is no condition that I know of where scrupulous attention to the details of treatment is more important. There is a temptation to give placebos and to meet each new ailment with a new prescription as the patient expects the physician

to do. There is, however, more constructive benefit in giving to the patient in addition to the necessary medication a little insight into the cause of the somatic complaint, and a little encouragement to subordinate the symptoms if they are, as is common, too engrossing an interest or if the threshold to pain is too low or the tolerance poorly developed.

Treatment of the basic neurosis may take one of several forms. Suggestion with its placebos for the soma and hypnotism for the psyche has been abandoned as being of little permanent value. Persuasion alone is effectual because it calls for constant application. Persuasion is a crutch on which the patient leans and without which he is again helpless. It cannot be dispensed from the doctor's office. It is used in sanatorium care but is of value only as a temporary expedient. Incidentally, since the acceptance of persuasive guidance by the patient is based on respect or even affection for the physician dispensing it, since its success is dependent on continuous faith in another person, it is wrong in principle, because what the patient needs is self reliance and self discipline. Compulsion, were it possible, might in many cases be the therapeutic answer. The family and friends of patients, and in fact society at large, would, however, hardly support a regimen of severity and disciplinary routine. Yet circumstances sometimes accomplish this when the neurotic patient receiving sympathetic and expensive sanatorium care loses his money, is faced by an unsympathetic world and is in consequence suddenly cured. One sees less psychoneurosis among men than among women partly because economic compulsion forces the man to keep his emotions under control, whereas his wife, better protected and with some one else to do the worrying, gives way to hers. I heard recently a story of a prosperous and neurotic patient who insisted on an interview with a prominent psychiatrist. The psychiatrist was just ready to leave for a summer vacation but under the insistence of the patient and his family was persuaded to delay his departure. The patient arrived and was asked to tell his story. As he recited his woes the mountains and streams were, I suppose, beckoning his doctor listener and when the story was finished he looked at the patient and said bluntly "Well, what of it?" The patient under the sting of this rebuff straightened out his mental processes and needed no further treatment. This was an unusual situation and an unusual patient; nevertheless the story has its point, and I think we may be justly accused of sometimes encouraging with too much sympathy some of the psychoneurotic states.

The treatment of choice is psychoanalysis, with the patient being made to understand himself, to appreciate the mechanism of the inter-

relation of his mental conflicts and his physical distress, to minimize his symptoms through this realization of their significance, and to recognize his limitations. As mentioned before, the will to get well is indispensable to recovery and the hopeless cases are those in which a life of invalidism is easier and more interesting than a battle for existence with inadequate mental equipment.

THE WEIR MITCHELL REGIMEN

When the psychoneurosis is completely disabling, the old Weir Mitchell treatment is often most effective. It is sound in theory and efficient in its application. The patient is, after careful clinical study, put in an institution, preferably a quiet convalescent or nursing home. He is completely isolated from his old environment and an effort is made to start him off anew, physically and psychically. An efficient and sympathetic nurse is essential. Except for the visits of the doctor and the nurse he is completely shut off from the outside world. He is not even allowed to receive or to write letters. He is put to bed and placed on a semistarvation diet. After a few days, if there is no serious gastrointestinal disorder, the diet is rapidly increased and the patient's first new interest is perhaps in his food and in his increase in weight. Massage and hydrotherapy, which at first are sedative in character but later more vigorous, are part of the regimen, and the visit of the masseur comes as an added diversion and interest. Later, occupational therapy of some simple type is added to afford some physical activity and training in concentration. As the patient improves he is gradually allowed to extend his activities, to venture out for short walks, to come again in contact with the world. The role of the physician through all this is that of the master whose word is law but who, with encouragement, stands ready to help the patient find himself and by his professional skill to relieve the physical discomforts. What is needed in the attending physician is not a highly specialized knowledge of psychiatry or of any of the other specialties but rather a breadth of medical vision and skill that will enable him to make the patient comfortable. The physician should have a large fund of patience and compassion and common sense so that he can establish contact with the patient and win his confidence and, finally, should have the ability to call for and profit through help from consulting specialists when such aid is indicated.

The unfortunate part of the Weir Mitchell regimen is that it is possible only for the well-to-do; but the basic principles may be used generally. For example, even a clinic patient can arrange for rest in the quiet of her room for a period each day; she can resort to the bathtub for modified hydrotherapy; she can get a

taste of comparative isolation by visiting the home of some unmarried or childless friend once a week; she can test the value of occupational therapy by developing a hobby, and she can, of course, follow the required dietary regimen. If meanwhile the somatic complaints are adequately treated and the doctor takes the patient into his confidence and makes her understand the rationale of the procedure, the results may be most encouraging.

PSYCHOTHERAPY

Concurrently with the physical routine of such treatment there must be carried on a reeducation in mental processes—and sometimes one has to revamp completely the patient's point of view and his objectives if one is to have any more than temporary relief. The first requirement is complete insight by the patient into the working of his own instincts, emotions and sentiments, and an understanding of his conflicts and maladjustments. The next step is the working out of a practical solution of the problems presented. The patient must be made to understand that it is not so much the harassment of his environment or of the situation in which he finds himself that causes his mental turmoil as it is his own failure to take his bearings, study his charts, lay out a course and get under way. It is indecision and uncertainty as to what is really wanted or as to what one should do that causes the conflict, rather than the disagreeable factors themselves. For example, one must often explain to a patient whose maladjustment is due to marital conflict that from the medical point of view it is immaterial whether he gets a divorce or decides to accept the situation as inevitable, but one or the other he must do.

Some of these people must be taught to acquire a philosophy of life which Osler¹ summed up in the Latin word "*acquiescentia*." By this he meant schooling oneself not to expect too much of life or of the people among whom one lives, learning that "we aim at the unattainable and must be content with finding broken pieces," accepting courageously disappointment and defeat and joyously fighting on, with only the acquisition of quiet wisdom as one's reward. Carlyle said of Teufelsdröckh that after a period of "ragings and despairings" over a soul tragedy "the first mad paroxysm past . . . he collected his dismembered philosophies and buttoned himself together." Some of our psychoneurotic patients must be told quite bluntly to do just that. And, to quote still further, they may well be asked "What is it . . . thou has been fretting and fuming and lamenting and self tormenting on account of? Is it not because thou art not happy? Because thou (sweet gentleman) art not sufficiently honored, nourished, soft-bedded and lovingly cared for?"

¹ Osler, William: *Acquiescentia*, with Other Addresses, Philadelphia, P. Blakiston's Son & Co., 1930.

Foolish soul! What act of Legislature was there that thou should be happy? A little while ago thou had no right to be at all."

In the practical working out of this buttoning of oneself together, the cultivation of hobbies is most helpful. It is often difficult to find anything outside of work and family life that has ever intrigued these individuals, and in the slough of despond in which one finds them it is often next to impossible to create an interest. However, a study of the individual's mental and physical capacities should enable one to prescribe, as one would a medicine, some activity for rather serious cultivation. It is well to have two hobbies, an outdoor one involving physical exertion and an indoor one calling for some mental concentration or manual dexterity. It makes little difference what one turns to, it may be working in the garden and making a serious study of bridge, or it may be fishing and collecting stamps. The important thing is to develop some variety in the psychic diet.

PROPHYLAXIS

One should not close a discussion such as this without some general considerations of the causes of and prophylaxis against such psychic failures as we have been considering. After all it is inevitable that in this business of development and of achievement or even of mere existence we should encounter obstacles and problems and unpleasant as well as pleasant experiences. A normal response to this is a strengthening of moral fiber, mental stability and stamina. The ships that founder have some defect in their construction. Says Macfie Campbell,⁵ apropos of this, "For the somatic functions to work, energy must be readily available and there must be reserves so that work can proceed smoothly and emergencies be met. Psyche too must have reserves, must have her store always readily available. It is too late, when an emergency is met, to seek for external resources. A richly stored mind is not a question of original endowment; although native ability is important it is the result of systematic industry, of careful utilization of time, of the utilization of opportunity. If, when serious demands are made, the necessary resources are not available, habits have not been formed, knowledge is absent, a code of conduct is not part of their equipment—inadequacy, inferiority, distress are the result." Let leisure time, he urges, be utilized in part to stimulate and enrich one's thought and contribute to one's philosophy of life. His idea may be summed up in the admonition "Develop your background."

I have spoken of the need for a dominant central sentiment. With such a sentiment there is no conflict or indecision as situations arise.

But, as has often been pointed out by McDougall and others, this sentiment must be organized around something that cannot be lost, preferably around an ideal or rule of personal conduct. Thus one may develop the impregnable armor of self sufficiency and, though money, position, family, even reputation is lost, be invulnerable. The rules of conduct and a code of living can never be taken away and need never be lost. Strength and stability of character have these as a backlog.

THE ART OF LIVING

Having thus a strong background and a guiding motive, what now does the healthy mind seek? What is the goal? I think we normally change our course as we grow and taste of life. In early youth one usually has the urge or even the compulsion to do something worth while, to produce. With Carlyle's Teufelsdröckh, youth cries out "were it but the pitifulest infinitesimal fraction of a product, produce it in God's name, 'tis the utmost thou hast in thee; out with it then." Then, as youthful ardor cools, the gregarious instinct is likely to assert itself and the individual craves popularity and recognition. The herd instinct is strong. And finally as disappointments temper enthusiasm, as experience shows the instability of faith and dependence on others, the ultimate goal is personal happiness and independence. It has been said that true art consists in living the way you want to live and throwing aside if you wish the ways of your neighbors. And I think it is the psychological art because it makes for peace of mind rather than for conflict and maladjustment.

It might be objected that, if all of us selfishly followed this rule of conduct, civilization would come to a standstill; but I think not. Some men are immoral and evil because they want to be, but men are also moral and honest because for them therein lies happiness. We would still have the industrious and the lazy, the economical and the extravagant, the pacifist and the militarist. In spite of utter freedom of thought and action we would still have social reformers and uplifters. In fact, the world would be about as it is now except that there would be well ordered mental objectives and a recognized art of living.

For you who are about to go out to diagnose and treat the ills of mankind, it is immaterial whether you accept the psychiatric tenets of Janet or Freud or Jung, or whether in your philosophy you follow Nietzsche or James. It is essential, however, if you would be a wise physician and not merely a medical mechanic that you see in your patients more than just a bit of anatomic and physiologic machinery, and study and stand ready to mend their backgrounds, their dominating central sentiments, their philosophies of life and their objectives.

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⁵ Campbell, C. Macfie: The Diet of Psyche, J. Am. Dietet. A. 12:513 (March) 1937.

Comments and Reviews

CLINICAL SENSE AND CLINICAL SCIENCE

Condensed from an article by Dr. John A. Ryle, regius professor of physic in the University of Cambridge, in the Lancet, May 13, 1939.

We have all admired in our friends or our chiefs the ability to arrive, without betraying the whole process, at wise and accurate decisions. This ability is shared by all of us in some degree, or else we are no physicians. Swift and wise decisions have a clear relationship especially to length of experience. Clinical sense is not innate or intuitive but a complex faculty built on prolonged training and exercise of the special senses, with a sound knowledge of pathologic possibilities. Observational ability and habit, a retentive memory and aptitude for sifting and correlating experience are the main ingredients of clinical sense.

Observational ability and the wit to interpret phenomena may, on occasion, lead to surprisingly prompt and exact judgments. With the clinician and the puzzling case it is not the single physical sign so much as the circumstances of the illness, the age and habitus and environmental conditions of the patient, the syndrome echoing syndromes encountered before, or even a single peculiar symptom or sign recalling the features of a single other case. These and an estimate of "the whole patient" and of his reactions to his illness may tell more in diagnosis, prognosis and treatment than the most careful examination, more sometimes than all the details of a modern "complete investigation" with its attending expense and inconvenience to the patient. Such judgments cannot be called guesswork. They are the result of a discipline of the special senses, of an observational science differing only from the discipline and science of the laboratory worker in that the observations have not been set down in orderly protocols but lodged and stored in a busy mind. For the biologist's records and methods, the physician must constantly substitute his powers of memory and association. There are some stories of Sir William Gull's consultative triumphs, in which clinical sense and common sense prevailed where the wit or industry of others had been found wanting. A surgeon had a case of ununited fracture which was giving him concern and decided one day to waylay Gull and ask his advice on the case. Gull took a look at the man and said "Feed him on tomatoes"—nothing more. The instruction was obeyed and the fracture united. When asked later his reasons for this advice, he replied that the surgeon might know all about fractures but had failed to observe that the man had signs of scurvy.

Good clinical sense seems more rare today in the field of treatment than is the case with diagnosis. The urge to action, the over-reliance on surgery, the vaccine craze, the proprietary endocrine allurements, the blandishments of the advertising chemists all have helped to lead us astray. We must feel ashamed at times of the ready susceptibility of our profession to fads and crazes in treatment. Drugs doubtful and drugs inert, drugs unorthodox and even drugs dangerous are prescribed in vast quantities and often to the neglect of sensible management and regimen or a simple psychiatry. The man with good therapeutic sense avoids pitfalls and constantly adapts his physiotherapeutic and psychotherapeutic measures to the individual case, orders a shave or a change of room at the appropriate moment in a case of long illness; knows when to give morphine and when to withhold it; when to transfuse or not transfuse; when to tease, to be jocular or sympathetic, when to exhort or scold. At the same time he keeps abreast of new advances. The oncoming generations are obsessed with treatments rather than trained and versed in Treatment. I am disturbed by a falling off in the quality and quantity, or in the diffusion of sound clinical sense, among those just referred to as "the oncoming generations." But the fault is ours and not theirs. We allow them to be embarrassed by "a crowd of scientific facts" and methods instead of teaching them their proper place and use.

What is wrong with medical education that it should, while multiplying diagnostic aids and instilling far more basic science than our fathers had, be failing in its cultivation of judgment and the faculty of perception from which judgment derives? We need not go far for the answer. The overcrowding of the curriculum and the multiplication of accessory diagnostic methods are not alone to blame. . . .

The inevitable subdivision of medicine into specialisms has broken the continuity of teaching. The value of the "general approach" to every case, whether to a patch of eczema, an enlarged prostate or an anxiety state, is in process of being forgotten. Investigation is tending to supersede and exclude instead of to supplement clinical appraisal. In his first three years the student observes and investigates too little; in his last three years, while learning to observe and investigate, he forgets his physiology and thinks too little. If we could set ourselves to the task of restoring clinical discipline to its proper place, we should go far to counteract wrong tendencies and to assist our inadequate revisions of the medical curriculum.

MEANING OF CLINICAL SCIENCE

Let us now pass from the discussion of "clinical sense" to a consideration of "clinical science."

The applications of physiology, pathology, immunology, chemistry, endoscopic technic and radiology in medicine have conferred inestimable benefits, but they have also added embarrassments and have inhibited observational precision. They have hampered the orderly evolution of clinical sense where they might have enhanced it. They have made doctors more scientific in their methods and less so in their judgments. Concurrently with these disturbing evolutionary changes we welcome today the advent of a new branch of biologic inquiry which may be called clinical science. I cannot do better than quote a part of Sir Thomas Lewis's definition:

This science [he says] seeks by observation and otherwise to define diseases as they occur in man; it attempts to understand these diseases and their many manifestations, and here especially makes use of the experimental method. It makes definite experiments upon disease and watches the effects of experiment conducted by injuries however they arise; it culls, or actually creates and uses physiological and pathological knowledge immediately related and applicable to the diseases studied.

How can clinical science be fostered? Clinical science can be advanced wherever men of appropriate foresight and training have the time, the opportunity and the material within their reach. Sir James Mackenzie advanced clinical science in the course of a busy general practice. Men primarily engaged in practice or teaching will still make their contributions from time to time. The teaching hospitals and the professional units will make their contributions and play a useful part as training grounds for new recruits to the whole-time service of academic medicine; of necessity, however, they combine much undergraduate teaching and hospital routine with their research activities, and so their present atmosphere is not wholly favorable to scientific advancement. It would be a grave mistake for the disciples of clinical science to withdraw themselves too much into their own laboratories or to establish research institutions which would work independently of existing hospitals and university departments.

The interchange of thought and discussion of problems between the clinical scientist and the practicing physician and his assistants is one of the most hopeful developments of these innovations. The interchange of thought and partition of problems with other biologic scientists is as important. The clinical scientists must have beds of his own, not a large number, but he should be willing to confer on cases with his colleagues of the honorary staff, to stimulate their subordinates by his ideas and activities

and, while nursing his own interest, to become an active member of the larger hospital family.

We may have to accept that his scientific preoccupation with his problems entails a limitation of his clinical sense. Clinical sense is born partly of long and varied association with sick men, women and children, and partly of the very nature of that relationship. However separate a disease process may be, it tends to present in different ways and to have different effects in individuals. The physician learns more clinical sense, as a rule, from his private patients than from his hospital cases. He also acquires methods of approach and management which are sometimes of particular value in clinical assessments and are, on the whole, less easily acquired by the institutional research worker. Let us accept, however, that the clinical scientist is concerned rather with processes than with persons, and that his study of processes is not necessarily hampered, as the task of the physician would be, by limiting his view.

In the selection of research personnel, can we ask promising younger men to afford the time necessary for both disciplines—that which trains for clinical sense and that which trains for clinical science?

Lewis and his co-workers at University College Hospital have chiefly carried physiologic method into the clinical field. At Cambridge it is more likely that biochemistry will implement and direct our studies in the near future. But in neither place is it likely that one science alone will be called to the aid of the research physician. In neither place will other biologic methods remove the necessity for close observational method and training. I would beg of my friends in the metropolitan schools to search their hearts in the matter of medical education and to aim at so training their students that the coming generations of clinical scientists may still retain that "faculty of perception" which has been the hallmark of English medicine from the time of Sydenham.

Biologic scientists have sometimes looked askance at the work of the clinician. They do not appreciate the countless difficulties and interruptions to consecutive thought which the practice of medicine compels. The clinician, on the other hand, has sometimes belittled the work of the laboratory man who would assist him, knowing his lack of intimacy with the problems of personality, with the variability of diseases and symptoms, and with the severe limitations set by chance. Mistrust of this kind is foolish, and all occasion for it departs when there is close association between the practicing physician and the investigator within the same building. If the first and constant duty of the physician is to improve his clinical sense, his second is to preserve the closest possible contacts with all the related biologic sciences.

When science and practice work at close quarters, both must benefit.

In spite of all our difficulties the modern evolution of medicine is intensely interesting and full of promise. But to forget the discipline that assists the faculty of perception would be a calamity for which no other discipline could wholly compensate.

EDUCATION IN OBSTETRICS FOR GENERAL PRACTICE

Abstract of an article by Prof. W. Fletcher Shaw, of the University of Manchester, and president of the Royal College of Obstetricians and Gynecologists. Published in the British Medical Journal, Sept. 2, 1939.

Every teacher agrees that medical students must begin with a good general education and a sound knowledge of chemistry, physics and biology, to which must be added a good training in anatomy and physiology and, later, in pathology. In the last three years of his training the student must learn the general principles of the main clinical branches and how to apply the scientific knowledge he has previously acquired. He must be trained to elicit clinical facts by exact methods of examination and to piece these together. Thus he learns to observe, deduce and think. There can be no attempt to teach him all that is known in any one branch: that leads to confusion. Teachers must confine themselves to principles and should emphasize the interrelation between their own and other branches of medicine.

Given this sound foundation, the medical student is trained to remain a student all his life, capable of understanding and applying the advances which will be made and of adding to them himself. The young graduate is the product of the whole school and not of any one teacher, and it is only by cooperative effort of the whole teaching staff that a school fulfils its highest duty.

OBSTETRICS AND GENERAL MEDICAL TRAINING

Unlike other departments, obstetrics deals chiefly with physiology and for this reason alone would be worthy of a place in the curriculum. Another advantage is that in many schools obstetrics provides the only compulsory period for students of residence in the hospital. The main purpose of this is to teach the student obstetrics, but in a good hospital he will learn much more. Seeing the patients at all times of the day and night will develop his powers of observation; he will have impressed on him in the antepartum department the necessity of knowledge of general medicine and general surgery as well as of obstetrics; if he also attends domiciliary midwifery he will learn more of human nature and the handling of patients than in the whole of the rest of his medical course.

Some day we may waken to the great importance of this resident work and, by cooperation

with hospitals, make the last year of the course a resident one divided between medicine, surgery and obstetrics, with gynecology, and unburdened by the paralyzing effect of the final examination.

Pregnancy, labor and the puerperium are normal physiologic processes with a liability to develop varying degrees of abnormality. The whole effort of the antepartum department is to recognize and treat these abnormalities. Recognized beforehand and the appropriate measures decided on, few labors present any serious difficulty, while the same complications discovered only during the course of labor will often have a fatal termination for mother and child. In the antepartum department the student sees and examines large numbers of patients in normal health and learns to recognize any divergence from this state. Those who suffer from complaints during pregnancy he sees treated in that department or in the wards, and he soon realizes the value of early recognition and treatment. In the gynecologic department he learns that a large number of these patients suffer from troubles produced at childbirth and that many of these are preventable; while in the children's department he will see many victims of heredity, bad environment and obstetric miscalculations.

DIFFICULTIES IN TEACHING OBSTETRICS

One of the main difficulties, and one which can never be overcome, is that the onset and duration of labor cannot be controlled. It is therefore impossible to hold labor ward demonstrations at prearranged times, and the teaching on normal delivery must be left to junior members of the staff. Even the cases requiring major obstetric operations must, to a large extent, be left to the younger members. The professor of obstetrics is therefore in the same position for clinical teaching as would be the professor of surgery if the major part of his teaching was limited to emergencies.

Another difficulty which is rapidly disappearing is the misconception of the lay public that every qualified practitioner is a fully trained obstetrician capable of carrying out any obstetric operation. This leads to the worst evil of all—that the local reputation of a practitioner as an obstetrician depends chiefly on the speed with which he terminates his cases. The aim of the obstetric teacher is to turn out qualified practitioners who have a sound knowledge of normal midwifery. They must be able to recognize the abnormal and to deal with minor abnormalities. Unless they have resident postgraduate experience it is not their business to perform major obstetric operations. A further difficulty is the way in which gynecology has developed and the tendency for the surgeon to consider it a branch of general surgery divorced from obstetrics. These subjects can never be

divorced. They are indivisible and between them embrace the study of a group of organs in health and disease. A knowledge of general medicine is required as much as that of general surgery. No one can be a gynecologist who has not obstetric knowledge of physiologic changes in these organs; no one can be an obstetrician who has not gynecologic knowledge of the accidents and diseases to which they are heir.

Teaching facilities and hospital accommodation in obstetrics and gynecology have lagged far behind those of general medicine and surgery, and only in recent years has a demand been made that these should be adequate. While in some schools the hospital accommodation is still deficient, it is gradually being overcome. The facilities for teaching clinical obstetrics have greatly improved in the last few years. The student should understand, however, that the amount which can be taught him is limited and that this cannot include operative obstetrics.

As most gynecologic ailments date from a confinement or miscarriage, it is essential that this fact be taught along with obstetrics, as only thus can the student realize the remote effects of bad midwifery, which must be taken into consideration when deciding on any gynecologic operation. The teaching of operative gynecology is not part of a student's course.

CLINICAL WORK

Too much emphasis has been laid on didactic teaching. Students have not been left sufficiently to ferret out facts for themselves and so develop the most important gift of the medical practitioner—that of observation. But the pendulum swings too far when it is suggested that systematic lectures be abolished. In obstetrics, systematic lectures are essential. Unless the student has a sound knowledge of anatomy and physiology and of the mechanism of labor he can never understand what is then happening and so be able to recognize when the normal passes to the abnormal.

LIVING IN A MATERNITY HOSPITAL

The General Medical Council regulations require that each student shall live in a maternity hospital for two months, and this is the most valuable experience in his career. He lives in a midwifery atmosphere, hears cases discussed by the residents, sees his cases night or day and is not hurried from one department to another. During this time he must himself conduct twenty cases. This unfortunately tends to overestimate in the student's mind the importance of this part of labor, and the teacher must be ever vigilant to counteract the impression that the moment of birth is the only, or indeed the most important, part of obstetrics. Frequent attendance at the antepartum clinic should be insisted on. Here the student must learn abdominal palpation; to recognize con-

traction of the pelvis, especially in its minor degrees; to study the patient's general health, and to give advice on diet and general rules of life; and to realize the importance of regular examination of the urine and of taking the blood pressure. His labor cases should, if possible, be attended equally in the wards and in the patients' homes. The student must realize that labor starts with the first uterine contraction and that the obstetrician's knowledge and skill are called for more frequently before than when the child is actually coming over the perineum.

In the two months residence it is impossible for him to attend the same cases in the antepartum department and in the labor wards, but he should see his patient as soon as she is admitted and he should be allowed to examine her along with the house surgeon. From then until delivery the student should pay her frequent visits and be taught to recognize normal from abnormal contractions, advancement, termination, and the condition of the patient. In this way only will he learn that the use of forceps is not decided merely by the number of hours in labor and the desire of the patient and friends for its termination. In the puerperium he should pay daily visits and be taught to observe the progress of involution, signs of abnormality in the patient, state of the breasts, and progress of the baby. It is a wonderful opportunity to instill into him the necessity of observation.

In his first ten deliveries attended in the hospital labor wards he has learned to maintain scrupulous asepsis. With everything ready at hand in a modern hospital this is relatively easy. The remaining ten cases must be attended with an equally rigid asepsis but in much more difficult surroundings. With more thought and trouble the same degree of asepsis can be obtained, but the student has to realize what are the essentials on which he must concentrate. To the student the chief advantage of the district cases is the daily attendance during the puerperium. These visits should be made by the student alone and he should be encouraged to record daily all the essential points—temperature, pulse, lochia, involution, sleep, bowels, breasts, baby—and to report to a senior officer any divergence from normal. By bringing him into contact with patients and their families in their own homes he will get his first lesson in one of the most valuable and difficult arts—the tactful handling of patients.

GYNECOLOGY CANNOT BE DIVORCED

The teaching of clinical gynecology is much easier than the teaching of obstetrics. As in medicine and surgery the patients come to outpatient departments at regular hours and are admitted to wards and operated on on regular days. Classes therefore can be organized in outpatient departments, wards and operating

rooms. There is one important barrier to teaching. Generally, a medical or surgical case can be examined by a number of persons and, if the diagnosis is in doubt, can be examined time after time. Not so a gynecologic case. The number of examinations made in each is limited. The practitioner must be taught that one physical examination must suffice. This means that the history of the case must be taken very carefully and each point considered in relation to the others, so that the gynecologist must have in mind what conditions could produce these symptoms in a woman of that age and history. In other words, his physical examination must be a differential diagnosis between the possible causes. Without this careful digestion of the history, physical signs are of little value. It is therefore of prime importance that the student should have beds allotted to him, should take careful notes of each patient and should be taught to find the possible diagnosis before an examination is made.

During the whole course of gynecology, emphasis must be placed on the interrelationship of obstetrics and gynecology, especially on the fact that many of the conditions found in the gynecologic department date from a confinement or miscarriage and that many of these could have been avoided.

If it is possible to arrange that one month of the six is spent in the children's department, especially when it has beds for infants, the student will be taught to consider the child in the antepartum department, the labor ward, the maternal cot, the babies' ward and, finally, the children's ward—a continuous picture of this ever changing subject. He will realize that an obstetrician's duty is not merely to produce a living child but that both mother and child must be left at the end of the puerperium in a perfectly healthy condition—the one to take her place in life unhampered by physical disability, the other to grow into a healthy citizen.

BEDSIDE LIBRARY FOR MEDICAL STUDENTS

From "Aequanimitas and Other Addresses," by William Osler.

A liberal education may be had at a very slight cost of time and money. Well filled though the day be with appointed tasks, to make the best possible use of your one or of your ten talents, rest not satisfied with this professional training, but try to get the education, if not of a scholar, at least of a gentleman. Before going to sleep read for half an hour, and in the morning have a book open on your dressing table. You will be surprised to find how much can be accomplished in the course of a year. I have put down a list of ten books which you may make close friends. There are

many others; studied carefully in your student days these will help in the inner education of which I speak:

- I. Old and New Testament.
- II. Shakespeare.
- III. Montaigne.
- IV. Plutarch's Lives.
- V. Marcus Aurelius.
- VI. Epictetus.
- VII. Religio Medici.
- VIII. Don Quixote.
- IX. Emerson.
- X. Oliver Wendell Holmes—Breakfast-Table Series.

TESTS FOR SYPHILIS AMONG COLLEGE STUDENTS

A study prepared by the U. S. Public Health Service, based on blood tests of 78,388 undergraduate students in 515 American colleges, indicates that two out of every thousand students examined are infected with syphilis. This rate is practically the same as that of non-college people of the same age. For the general population of the country, the rate of infection in the age group 15-19 years, based on estimates of the U. S. Public Health Service in November, is about 1.8 per thousand. The apparently higher college rate results from including an unknown number of students in higher age groups up to 24 years in the present survey. Other results of the survey indicated about 15 per cent less syphilis among college women than among men, a difference which it is said parallels the nation-wide prevalence rates by sexes. There was also found a slightly lower rate among college women than among women of the same age group in the population at large. However, little difference was shown between one region in the United States and another for either sex, or between the rates for schools with large as compared to small student bodies. Of the 515 institutions participating in the survey, 219 have facilities for testing the blood of students. Since blood testing in colleges when given are usually made on freshman students, the great majority of those tested were in the age group of 15-19. Two thirds of the college authorities approached in this survey believe that some method of testing the students for syphilis is desirable. A fair proportion of them, however, are still of the opinion that syphilis is bounded by class or racial lines and hence think that blood testing is unnecessary in colleges.

The Strenuous Life.—I wish to preach, not the doctrine of ignoble ease, but the doctrine of the strenuous life, the life of toil and effort, of labor and strife; to preach that highest form of success which comes, not to the man who desires more peace, but to the man who does not shrink at danger, from hardships or from bitter toil, and who out of these wins the splendid ultimate triumph.—Theodore Roosevelt.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Scholarship—Young Applicants Preferred

The award of the Lewis Cass Ledyard Jr. Fellowship is expected to be made by April 1. Applications should be addressed to the Committee of the Lewis Cass Ledyard Jr. Fellowship, The Society of the New York Hospital, 535 East Sixty-Eighth Street, New York City. Preference will be given to young graduates in medicine who have demonstrated fitness to carry on original research. The income, amounting to about \$4,000 a year, will be awarded to investigators in the fields of medicine and surgery or some closely related field. About \$1,000 of this amount will be applied for supplies or expenses of the research and \$3,000 as the stipend. The research work is to be carried on at the New York Hospital and Cornell University Medical College.

Meetings in the Homes of Faculty Members

The Scientific Forum, which is another activity of the Student Activity Plan at Tufts College Medical School, Boston, which meets in the homes of various physicians on the faculty, met January 28 at the home of Dr. Siegfried Thannhauser. Papers were presented by Mr. Thomas F. Broderick Jr., '41, on the use of the x-rays in acute abdominal conditions, and by Miss Marguerite L. McKay, '41, on sterility in the female. The society met at the home of Dr. Louis E. Phaneuf, February 11, when Mr. Peter S. Zarecki Jr., '41, read a paper on anemias of pregnancy, and Mr. John J. Talinski, '41, on displacements of the pelvic organs following childbirth. Later in February the forum met at the home of Dr. Benjamin Sachs, when two papers on ophthalmology were presented by Mr. Edward Joseph Howley, '41, and Mr. Paul J. Coughlin, '41.

Harvard Expands Work in Legal Medicine

The dean of Harvard University Medical School, Boston, Dr. C. Sidney Burwell, announced, January 26, in his annual report that Harvard University Medical School has undertaken expansion of its work in legal medicine and will train a small number of men who desire to specialize in that field. The Harvard Law School is cooperating in the expansion, the two schools offering a course for undergraduate medical students, giving a survey of the field of legal medicine and the essentials of medical jurisprudence. New laboratories are being set up for this department in that portion of Harvard Medical School in which there is already located the George Burgess Magrath Memorial Library of Legal Medicine. Dr. Alan R. Moritz, who spent the last two years abroad studying the organization and practice of legal medicine in European countries, will be in charge of the department. He is the first to hold the professorship of legal medicine established at Harvard in 1936 in honor of the late Dr. George Burgess Magrath, pioneer in this field. Dr. Moritz was formerly chief pathologist at the University Hospitals, Cleveland, and associate professor at Western Reserve University. This department will also provide an interesting example of cooperation among the three medical schools in Boston, as the lectures will be attended also by third year men from Tufts Medical School, and next year it is expected that medical students from Boston University will also participate.

Loan Fund for Students at Colorado

Dr. Frank W. Kenney, Denver, has presented to the University of Colorado \$3,000 in the form of 4½ per cent bonds of the Pennsylvania Railroad to constitute a loan fund, the income of which is to be used to assist worthy students in the medical school. Preference is to be given to eager and ambitious boys in the junior and senior years, although the donor's preference is not to be considered mandatory. Loans are to be at a moderate rate of interest and are not required to be evidenced by a legal obligation payable at a given time. The student will, however, agree to repay the loan as soon as he can. Selection of students who shall receive such loans will be made by a committee of three, which at present comprises Drs. James J. Waring, George B. Packard and Casper F. Hegner, all of Denver. Vacancies in the committee will be filled by the trustees of the Medical Society of the City and County of Denver.

Scholarships Awarded at Columbia

Dean Willard C. Rappleye, of Columbia University School of Medicine, New York, announced October 19 the award of scholarships for the present academic year to the following students, among others. The winners received their premedical training in various colleges and universities in many different states and Puerto Rico. William J. Welch, of Yale, won a grant of \$900, and Alando J. Ballantyne, University of Arizona, \$600. Among those awarded resident scholarships of \$500 each were: Carroll L. Conley, Johns Hopkins; Fred M. Davenport, Columbia; John J. Hutchinson, University of Illinois; Wilson W. Schier, Lawrence College; Freeman Irby Stephens, Columbia; Abraham Geffen, Emory; Virginia M. Goddard, Tufts; George L. Hawkins Jr., University of Missouri; Milton B. Smith, University of California; Howard A. Blazar, Brown; Stanley W. Burwell, Columbia; Thomas P. Hennelly, Holy Cross; Bayles R. Kennedy, University of California; Eugene C. McCann, Tufts; William G. Schoch, University of Arizona; Roland G. Tremblay, University of New Hampshire, and Orrin J. Van Dyk, Harvard.

Among those awarded scholarships of \$500 each were: William T. Adams, Utah State; Archibald G. Fletcher Jr., Princeton; Fay P. Greene, Southwestern; Louis Nash, University of Nevada; William E. Owen, Cornell College, Mount Vernon, Iowa; David T. Dresdale, Brown; Irvin H. Trinchler, New York University; Aldred Duschatko, Columbia College; John Milne, Dartmouth; Theodore Gold, Columbia College; John Dean, Yale; Edward H. Townsend Jr., Harvard; Alden K. Boyd, Cornell; Gustav Bansmer, Columbia College.

Stuart W. Cosgriff, Holy Cross; Paul A. Kirschner, New York University; Charles G. Zubrod, Holy Cross, were awarded scholarships of \$400 each, and Kenneth B. Wright, Columbia College, and John J. Ryan, New York University, scholarships of \$350 each.

Christmas Party at Louisiana

The first Christmas party in the history of the School of Medicine of Louisiana State University, New Orleans, was held December 22 when faculty members, secretaries, technicians, and others on the staff, met in the library which was decorated for the occasion. Dr. Charles Midlo, master of ceremonies, made "a highly amusing opening talk." A sextet including

among others Drs. W. K. Hall, bass, and Edgar Hull, tenor, sang; candy and punch were served and there were gifts for each one present. At the conclusion of the party, Dr. B. I. Burns, dean of the school, made a speech and announced that the Christmas holidays for all the staff members would extend from Friday evening until Wednesday morning after Christmas.

The Ephraim McDowell Memorial Home

The Kentucky State Medical Association dedicated in Danville in May the home of Ephraim McDowell, in which house he performed the first ovariectomy in 1809 (Student Ephraim McDowell, *THE JOURNAL*, Dec. 24, 1938, p. 2441). Dr. Charles A. Vance, Lexington, chairman of the council of the Kentucky State Medical Association, presided at the dedication, and Dr. Irvin Abell, Louisville, past president of the American Medical Association, gave the principal address. The home was accepted for the state by Governor A. B. Chandler. Dr. Edward P. Heller, Kansas City, Mo., represented the Missouri State Medical Association at the dedication. Dr. Edward V. M. Mastin, St. Louis, the great-great-grandson of Ephraim McDowell, who represented the Southern Surgical Association, and Dr. James D. Hancock, Louisville, acting president of the Kentucky State Medical Association, were among the speakers. Dr. Louis Frank, Louisville, past president of the Kentucky State Medical Association, presented to the home the Arch Barkley Memorial Gifts. The home and its treasures, including among other things the surgical instruments used by McDowell, then passed into the keeping of the Department of Parks of Kentucky. Here is not only the room in which McDowell operated on Mrs. Jane Todd Crawford, but the old well in the garden, the servants' quarters, the kitchen and the now famous door knocker which was used by patients in all walks of life, including James K. Polk, who later was President of the United States.

Annual Meeting of Association of Students

Including delegates, visitors and observers, about 300 persons attended the fourth annual meeting of the Association of Medical Students in Detroit, December 27-29. The delegates represented some twenty American medical schools. The present paid up membership of the Association of Medical Students is said to be about 2,400. At this meeting, Thomas L. Perry Jr., Harvard Medical School, '40, was elected president. The vice presidents elected were Leopold M. Trifari, Tufts College Medical School, '42; Edmund M. Braun, New York University College of Medicine, '41; Jane B. Oldden, Woman's Medical College of Pennsylvania, '41; Joseph H. Haffkenshiel Jr., Johns Hopkins University School of Medicine, '41; John H. Cordes Jr., Emory University School of Medicine, '41; Paul H. Gray, Rush Medical College, '41; Thaddeus J. Bugelski, University of Buffalo School of Medicine, '41; Henry A. Caraco, Washington University School of Medicine, '41; William M. Christophersen, University of Louisville School of Medicine, '42, and Charles Roberts, of the Royal College of Edinburgh. Clifford A. Sager, New York University College of Medicine, '41, was elected chairman of the editorial board of the *Journal of the Association of Medical Students*, and Herbert F. Waldhorn, New York University College of Medicine, '42, editorial director.

Among the resolutions adopted was the following concerning student aid:

WHEREAS, The high cost of a medical education makes it difficult for many students to equip themselves completely, this convention reaffirms its stand on supporting local efforts "in the establishment of scholarships, student loan funds, and other methods of meeting the problem of the tremendous cost of medical education."

A spontaneous movement arose among the medical students at this meeting suggesting the possible fusion of the Interne Council of America with the Association of Medical Students, but final official action was not taken at this meeting.

At this meeting, the American Youth Congress extended to the Association of Medical Students an invitation to become a cooperating organization. After a spirited discussion a decision was reached to have local chapters of the association cooperate with the American Youth Congress in their locality and also to have the lay education committee of the Association of Medical Students continue its cooperation with the American Youth Congress without having the Association of Medical Students constituted a cooperating organization with the American Youth Congress.

The delegates made a tour through the River Rouge plant of the Ford Motor Company. On the second day a special feature was the presentation of the prize winning clinics conducted under the auspices of Wayne University chapter of the association. One of these was a colored movie of the "Physical Diagnosis and Examination of the Skeletal Musculature," prepared by Fred Margolis, '40, and a group of members of the association from Wayne University, and the other a model surgery clinic presented by Kenneth Campbell, '40, and another group of Wayne students. In addition to these demonstrations there was a program of clinics at the medical school amphitheatres.

Tufts Plans Revision of Premedical Course

Revisions in the premedical studies have been planned jointly by the chemistry and biology departments at Tufts College, Medford, Mass., and are expected to be ready to go into effect next fall, the *New York Times* reports. The chief objective of the curriculum is not only to give future medical students the best possible training for professional study but also to allow them greater latitude as undergraduates for cultural development. One of the most significant changes will be the elimination of the departmental majoring, as such, in chemistry and biology. The new plan will attempt to correlate the undergraduate work in college, wherever possible, with the course of study in the professional or medical school. It has been planned so that all the requirements will be completed in the first three years; the fourth year will be left free for electives, either in additional scientific study or, as the faculty would prefer, in cultural subjects. It is also planned to have premedical students advised by six men, three each from the departments of chemistry and biology, whereas at present these students are advised only by the head of the department.

Fees at Oregon

Fees and deposits paid by students at the University of Oregon Medical School, Portland, according to the catalogue of the school, are as follows:

Regular Fees	
Matriculation fee (not refundable).....	\$ 5.00
Resident tuition and laboratory fee, per term.....	95.00
Nonresident tuition and laboratory fee, per term.....	115.00
Building fee, per term.....	5.00
Deposits	
Deposit to reserve place in entering class.....	\$ 20.00
Breakage deposit—first and second years.....	15.00
Breakage deposit—third and fourth years.....	10.00
Special Fees	
Graduation fee.....	\$ 6.50
Late-registration fee.....	\$1.00 to 5.00
Penalty for late payment of tuition fees (full payment).....	minimum 2.00
Transcript fee.....	1.00

Vote to Drop the M.B. Degree

At a meeting of the entire student body of the school of medicine of Louisiana State University, New Orleans, in the assembly hall of the new Charity Hospital, the dean announced that the executive committee of the school of medicine has approved a proposal to confer the M.B. degree on graduates no longer but to grant the M.D. degree on the satisfactory completion of the fourth year. The Executive Committee felt that the action of the Louisiana State Board of Medical Examiners in requiring a year's rotating internship of all candidates for licensure in Louisiana makes it unnecessary for the school of medicine to require this service before it confers the M.D. degree. According to the *Tiger*, the Executive Committee will recommend to the administration of the university that the change become effective this year.

Equipment Required at Stanford

Medical students at Stanford University School of Medicine, San Francisco, are required to have the following equipment:

SECOND YEAR STUDENTS

Stethoscope (Ford)
Percussion hammer
Hemocytometer
Hemometer
Metal tape measure

THIRD YEAR STUDENTS

Sphygmomanometer (Tyco)
Ophthalmoscope
Otoscope
Head mirror 3½ inch diameter and one-half inch aperture and band
Nasal speculum (Vienna model)
Nasopharyngeal mirror No. 0
Laryngeal mirror No. 4
Ear speculums (Toynbee, nest of three)

Premedical News

Dr. Robert U. Patterson, formerly Surgeon General of the U. S. Army and now dean at the University of Oklahoma Medical School, Oklahoma City, was the principal speaker at a meeting of the Oklahoma Alpha chapter of Alpha Epsilon Delta, an honorary fraternity for premedical students, in Oklahoma City, December 7. His subject was "The Fields of Medicine Open to the Young Doctor"; other speakers at the meeting were Samuel W. Reaves, dean of the School of Arts and Sciences, whose subject was "The Layman's View of Medicine," and J. T. Self, who spoke on "The Status of the Premedic." Seventeen Oklahoma students were initiated into the local chapter on this occasion. On November 7 the Alabama Alpha chapter of this premedical fraternity awarded a silver cup to Harry O'Rear, of Jasper, Ala., for having made the highest average in biology and chemistry during his freshman year.

Scholarships and Prizes at Wayne University

The Alumni Association of Wayne University College of Medicine, Detroit, has subscribed an endowment fund that provides for research grants, student loans and scholarship prizes. Undergraduate scholarships are granted to a number of deserving students on a student loan basis, after investigation by a special scholarship committee in conjunction with the board of trustees of the alumni association. Applications must be from the junior and senior classes. The Alumni Association gives a prize of \$50 to the senior student who has the best scholarship record through the four years. The Alumni Association also offers an annual prize of \$50 for the best scientific work done during the year by a recent graduate.

Dr. Ranson Will Give the Dunham Lectures at Harvard

Harvard University, Cambridge, Mass., announces that a series of Edward K. Dunham lectures will be delivered at the medical school, March 4, 6 and 8, by Dr. Stephen W. Ranson, director of the Neurological Research Institute at Northwestern University Medical School, Chicago. All members of the medical school and other interested professional persons are invited. Dr. Ranson was head of the department of anatomy at Northwestern University Medical School from 1912 to 1924, was head of the department of neuro-anatomy and histology at Washington University Medical School, St. Louis, from 1924 to 1927, and then returned to Northwestern University Medical School. Dr. Ranson is a member of the editorial board of the *Archives of Neurology and Psychiatry*, which is published by the American Medical Association, and is the author of a well known book, "The Anatomy of the Nervous System."

Scholarships and Assistantships at St. Louis University School of Medicine

Students showing special proficiency in the first two years at St. Louis University School of Medicine, St. Louis, are eligible for appointments as assistants, who take part in teaching and research under the supervision of the departmental director. To be appointed to an undergraduate assistantship, the applicant must agree to accept the appointment for four years and to devote half of his time to assigned duties in a chosen department. The students so appointed rank as junior assistants during the first two years and as assistants during the third and fourth years. The appointee is free from tuition for the four years and receives an annual salary ranging from \$250 to \$350.

The Dr. Samuel T. Lipsitz Scholarship of \$150 a year is awarded to a selected student. The Levi and Peppe Wolfert Scholarship is awarded annually for the purpose of assisting a needy student and also to help in financially gifted one.

The Student Aid Fund awards \$50 a year to a student in need of special assistance.

In addition, St. Louis University School of Medicine offers a number of graduate fellowships in the basic sciences and in the clinical sciences. Inquiries concerning these matters should be addressed to the Dean of St. Louis University School of Medicine, St. Louis.

Scholarships at Yale

Certain Yale University funds are available in part for financial aid to students in the school of medicine. Some of the scholarships available are as follows:

The Judson Bardwell Memorial Scholarship.
The Edward Thomas Cathoun Scholarship, for work in pathology.
The Annie G. R. Garland Memorial Scholarships. Awarded to worthy students in the graduate and professional schools of the University who are chosen primarily because of their ability, character and promise of future usefulness and the quality of their work.
The James Raymond Goodrich Memorial Scholarships.
The Joseph Hendley Townsend Scholarship.
The Flora Adler Ullman Memorial Scholarship Fund.
The Rosa Verdi Scholarship.

Lecture to Marquette Students

Dr. Julius Bauer, clinical professor of medicine at Louisiana State University School of Medicine, New Orleans, and formerly of Vienna, addressed the students of Marquette University School of Medicine, Milwaukee, January 23, and also gave the Louis M. Warfield Memorial Lecture in Milwaukee, sponsored jointly by the Milwaukee Academy of Medicine, the Milwaukee Internists' Club and the Wisconsin Anti-Tuberculosis Association.

Repercussions of International Events

The regular student body of Harvard Medical School, Boston, shows some repercussions of international events, with a slight drop in numbers registered from Canada and China. In recent years there has been an increase in the number of men from the Latin American countries. The student body of 522 has men from Argentina, Guatemala, Colombia, Canada, South Africa, Siam and Germany; last year there were two men from Finland in the student body, two from France, three from Belgium, four from London and one each from Germany, China, Wales, Hungary and Chile.

Tulane Students Honor Retiring Dean

A meeting of the student body of Tulane University School of Medicine, New Orleans, and the faculty members was held January 27, in the Richardson Memorial building to honor Dr. Charles C. Bass on the eve of his retirement after eighteen years of service as dean of the medical school. On behalf of the students, Edward R. Villemez, president of the student body, presented a portrait of Dr. Bass to the university. Following the student's meeting, the faculty attended a luncheon where Dr. Rudolph Matas, professor emeritus of surgery, presented to Dr. Bass a scroll from the faculty. Dr. Bass is a native of Mississippi and graduated from Tulane University School of Medicine in 1899, joining the staff in 1904. In 1912 he went to Panama on an expedition, under the auspices of the department of tropical medicine, to continue his studies on malaria. He is said to have been the first successfully to cultivate the malaria parasite *in vivo*. He has done research also on hookworm, pellagra, beriberi and typhoid fever and is still active in research work. Dr. Bass has been president of the American Society for Clinical Investigation, the American Society of Tropical Medicine, and the Southern Medical Association. He was awarded the honorary degree of doctor of science by the University of Cincinnati in 1920 and the honorary degree of doctor of laws by Duke University in 1937.

Loan Funds at the University of Tennessee

The University of Tennessee College of Medicine, Memphis, has several loan funds whereby small sums may be lent to worthy students who have demonstrated their scholastic competency. A prize known as the Faculty Gold Medal is awarded each year to the graduate whose general record throughout the twelve quarters' course has been most satisfactory. There is also the Judge H. T. Ellett Scholarship, which is intended to make possible the study of medicine for some worthy Mississippi student who otherwise would not be able to pursue this work. Applications should be made to the office of the dean.

Medical College Restores Original Building

Founders Day at the Medical College of Virginia, Richmond, January 16, was marked by the dedication of the Egyptian Building, the first permanent home of the school, which has been recently restored. The college opened its doors in 1838 in an old remodeled hotel, but in 1845 a new building done in the Egyptian manner was completed and dedicated. After continuous use since its dedication the building had fallen into disrepair. Through the generosity of Mr. Bernard Baruch, New York, the building has been reconstructed. A new auditorium has been named for Mr. Baruch's father, Dr. Simon Baruch, who graduated from the school in 1862. The auditorium and the lobby on the first floor are in Egyptian design. The

upper floors are arranged for the departments of bacteriology and pathology for teaching, diagnosis and research. The program for the dedication included addresses in the morning by Drs. Walter H. Judd, until recently a missionary in China, on "Chinese Medicine" and Wyndham B. Blanton, Richmond, on the history of the Egyptian Building. In the afternoon the Brown Séquard Society presented Dr. George W. Thorn, Baltimore, who spoke on "Studies of the Adrenal Cortex" in the new auditorium. The evening program consisted of an address at the Richmond Academy of Medicine by Elmer V. McCollum, LL.D., Baltimore, on "The Place of Vitamins in the Maintenance of Normal Health."

Average Expenses at University of Chicago

An estimate of the average expenses in attending the medical schools at the University of Chicago for each quarter includes: rent and care of room, \$60; board, \$82, textbooks and supplies, \$25, laundry and cleaning, \$25; registration and health service fees, \$6, and incidentals, \$35, making a total of \$233, exclusive of tuition fees, which are \$150 a quarter.

Temple's Student Body

The current enrolment at Temple University School of Medicine, Philadelphia, totals 446 students from twenty-six states, Puerto Rico and Hawaii and represents 148 colleges. Physicians have enrolled seventy-one of their sons and daughters in the medical school. Of the 446 students, twenty-three are transfers from two year medical schools; thirty of the students are girls.

Dr. Keeton Elected to National Board of Examiners

Dr. Robert W. Keeton, Chicago, professor of medicine, University of Illinois College of Medicine, has been elected a member of the National Board of Medical Examiners to succeed the late Dr. Charles A. Elliott. Dr. Keeton is one of the first diplomates of the board, holding certificate No. 25. He graduated from Northwestern University Medical School in 1916.

Scholarship Fund at University of Georgia

The Charles McDonald Brown Scholarship Fund is available to students at the University of Georgia School of Medicine, Augusta, for the purpose of aiding them in defraying the expenses of their education. The interest on this fund is lent to worthy young men on condition that they obligate themselves to return it with 4 per cent interest.

Wisconsin State Board Questions

The following questions in surgery were given at the examination held in Milwaukee, June 27-30, 1939, by the Wisconsin State Board of Medical Examiners:

1. What facts are necessary to diagnose stone in urinary tract? Give treatment.
2. Why are fractures of pelvis serious? Briefly summarize treatment.
3. Describe in detail your surgical treatment of severance of all tendons on anterior side of wrist.
4. Discuss carbuncle—cite common locations—dangers and surgical treatment.
5. How would you prepare skin for a major abdominal operation? How would you prepare your own hands for the same job?
6. What is gas gangrene? Discuss cause, pathology and treatment.
7. Give the causes, symptoms and treatment of septic peritonitis.
8. In skull fractures, give symptoms, dangers. Discuss briefly your management thereof.
9. Discuss pleurisy with accumulation of pus. Give treatment.

Only eight of the nine questions were to be answered.

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PROBLEMS IN THE TREATMENT OF ADVANCED TUBERCULOSIS IN A MUNICIPAL HOSPITAL

BASED ON AN ANALYSIS OF THE COURSE OF
DISEASE AND RESULTS OF PNEUMO-
THORAX TREATMENT

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AND

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PHILADELPHIA

From the point of view of the public health, isolation and treatment of patients with clinical disease constitute important factors in the control of tuberculosis. Many patients prefer to remain at home under the care of private physicians or clinics, a procedure that may be justified if sputum can be kept negative for tubercle bacilli or if adequate measures are taken for the protection of persons in contact. For the majority of patients, however, institutional care is advised. Most communities provide sanatorium facilities for patients with more favorable prognosis. Infectious patients with advanced disease and less favorable prognosis are usually cared for in special wards of local hospitals, the major objective being the removal of these individuals from contact with the community.

In some municipalities, collapse therapy is employed as a partial solution of the lack of sanatorium facilities. Suitable patients are admitted to an institution until collapse is established. If the sputum is rendered negative or if a satisfactory collapse appears probable, the patient is discharged to a dispensary for the continuation of artificial pneumothorax with rest in bed at home and the supervision of public health nurses to supplement the treatment. Through the use of so-called ambulatory pneumothorax, sanatorium waiting lists are relieved and the number of sputum-positive patients in the community is reduced. Hruba¹ recently reported the extent to which this method of tuberculosis control is employed in Chicago. Although it is not ideal treatment, its value is to some extent proportional to the lack of beds for institutional care.

It is a problem to know to what extent treatment, particularly collapse therapy, should be applied in the hospital to patients admitted primarily for purposes of isolation. To patients with advanced tuberculosis whose prognosis is apparently hopeless there is a tendency to apply artificial pneumothorax because it is felt that the patient will surely die without some form of "active" treatment. Collapse therapy is instituted in

the hope that improvement, however improbable, may be the result. In over zealous efforts to help these patients, more harm than good may be done. In this paper an attempt has been made to determine the indications and limitations of collapse therapy for patients in the tuberculosis wards of a large city hospital.

A series of 504 patients discharged consecutively from one of the services of the Department of Tuberculosis of the Philadelphia General Hospital during the three year period 1935-1937 has been reviewed. Pulmonary tuberculosis was diagnosed in 441, or 87.7 per cent, of cases.

Artificial pneumothorax was attempted in 137 instances, but in seventeen of these no free pleural space was found. The remaining 120 cases in which pneumothorax was established constituted 27 per cent of the cases of pulmonary tuberculosis. Table 1 shows the stage of disease and the results of sputum examinations on admission of the patients to the hospital in the total group and in those in whom pneumothorax was subsequently established. The great majority of patients, 352, or 79.9 per cent, had far advanced lesions.

Tubercle bacilli were found in the sputum of 377, or 85.4 per cent, of the total group and in 106, or 88.3 per cent, of the pneumothorax group. The large number of patients with far advanced, sputum-positive disease stresses the importance of a city hospital in the removal of foci of infection from the community. It likewise follows that pneumothorax is indicated in a relatively small proportion of cases and that the value of this form of therapy is limited.

Unfortunately many patients with sputum-positive tuberculosis fail to remain in the hospital and return to their homes, where they act as foci for the further spread of the disease. Of the 441 tuberculous patients 247, or 56 per cent, remained in the hospital less than ten weeks, 392, or 87 per cent, remained less than seven months and twenty-seven, or only 6 per cent, remained more than one year.

Table 2 shows the reasons for discharge of white and colored patients in both the total and the pneumothorax groups. Death occurred in the hospital in 190, or 43 per cent, of patients. It was the cause of discharge of 33 per cent of white and 52 per cent of colored patients.

Of the white patients 28 per cent and of the colored patients 31 per cent left the hospital against advice. However, these percentages, which are almost equal, require further analysis. After subtracting the discharges due to death there remain 142 white and 109 colored patients who either accepted treatment or left against advice. It now appears that sixty, or 40 per cent, of the 142 white patients and seventy-one, or 65 per cent, of the 109 colored patients left against advice, a fact showing that actually there is a decided differ-

From the Philadelphia General Hospital and the Henry Phipps Institute of the University of Pennsylvania.
1. Hruba, Allan J.: Collapse Therapy of Tuberculosis, *Am. Rev. Tuberc.* 40:255 (Sept.) 1939.

ence between the two groups. It is the large number of patients who leave against advice that limits the value of the hospital in its function of protecting the community.

Artificial pneumothorax was attempted in 137, or 31 per cent, of the 441 tuberculous patients, and some degree of collapse was obtained in 120, or 27 per cent. It has already been intimated that not infrequently this form of treatment was tried because the prognosis with

TABLE 1.—Extent of Disease, with Results of Sputum Examinations

	Total			Pneumothorax		
	Sputum Positive			Sputum Positive		
	Num- ber	Num- ber	Per Cent	Num- ber	Num- ber	Per Cent
Minimal.....	24	9	37.5	1	0	0
Moderately advanced..	65	39	60.0	18	12	66.6
Far advanced.....	352	329	93.4	101	94	93.0
Total.....	441	377	85.4	120	106	88.3

rest treatment alone was considered to be very poor. In table 3 the degree of selective collapse in the 137 cases in which pneumothorax was attempted is indicated. This was evaluated by x-ray examination at the time of optimal collapse, obtained by pneumothorax alone or with the aid of pneumonolysis. As shown in table 3, there was no significant difference between white and colored patients in the probability of obtaining a good collapse. A satisfactory anatomic collapse of the diseased portion of the lung was shown by x-ray examination in twenty-six, or 19 per cent, of patients; that is, approximately one in five.

RESULTS OF PNEUMOTHORAX TREATMENT

Most authorities are of the opinion that the results of treatment should be evaluated only after a five year period of observation. In the type of hospital patient with which we are dealing it is difficult to fulfil this requirement. Since the majority remained under observation for only a short time, it was decided to separate patients into two groups, depending on the length of hospitalization. Ten weeks was arbitrarily chosen, because if the period was longer the number of patients remaining for whom results could be evaluated would be too small. Although ten weeks is a very short period, it should be pointed out that of the seventy-seven patients for whom the results of pneumothorax treatment have been evaluated, sixty-five, or 84 per cent, were under observation for more than five months and forty-one, or 53 per cent, were under observation from one to five years.

There were eighty-eight patients in whom pneumothorax was attempted who were under observation for more than ten weeks, including eleven in whom no space was obtained and seventy-seven in whom pneumothorax was continued. In evaluating the results of pneumothorax treatment, only these seventy-seven patients are considered. Although this constitutes a very small series in comparison with others that have been reported from institutions for the care of tuberculosis, it is believed that the series here under consideration merits report as an indication of what may be expected in the tuberculosis wards of a large general hospital under the conditions obtaining today.

In table 4 the results of treatment in the seventy-seven cases are considered in relation to the type of pneumothorax space. The results of treatment were determined by x-ray examination and by clinical cri-

teria. In sixty-four instances there were open cavities, of which twenty-two, or 34 per cent, were apparently closed by collapse therapy. Of the sixty-seven patients with positive sputum twenty-one, or 31 per cent, became sputum negative. The sedimentation rate showed improvement in 64 per cent, and there was a gain in weight in 53 per cent of patients.

It has already been shown that approximately one in five of all patients on whom pneumothorax was attempted obtained a satisfactory collapse. It is among the small number of patients who received a good collapse that most satisfactory results followed, improvement occurring in 87 per cent. On the other hand, only 29 per cent of those with a fair space and 23 per cent of those with a poor space were improved. It is interesting to note that of the eleven patients observed more than ten weeks in whom pneumothorax could not be established, three, or 27 per cent, were improved, this percentage being approximately the same as the percentages found for patients with a poor or a fair pneumothorax space. The group in whom pneumothorax was established was made up of thirty-two colored and forty-five white patients. Analysis of the records of the eight colored patients who improved shows that six had a good collapse and two had a fair collapse, while no patient with a poor collapse had this result. On the other hand, of the twenty-eight white patients who improved, thirteen, or 46 per cent, had a good collapse, ten, or 36 per cent, had a fair collapse and five, or 18 per cent, had a poor collapse.

In an attempt to control widespread disease, bilateral pneumothorax was given in sixteen, or 21 per cent, of seventy-seven cases that are being discussed. Eight of these patients were improved, all of them having been under observation for more than two years. In six instances there was a good bilateral collapse and in two instances there was a good collapse on one side and a fair collapse on the opposite side. On the other hand, of the eight patients who were unimproved, only

TABLE 2.—Disposition of Patients on Discharge

	Total			Pneumothorax		
	White	Colored	Com- bined	White	Colored	Com- bined
Died						
Number.....	70	120	190	5	19	24
Per cent.....	33%	52%	43%	7%	31%	27%
Discharged with consent						
Number.....	55	26	81	20	13	33
Per cent.....	26%	11%	15%	45%	23%	57%
Discharged to sanatorium						
Number.....	24	10	34	12	6	18
Per cent.....	11%	4%	8%	19%	11%	17%
Discharged against advice						
Number.....	60	71	131	17	19	36
Per cent.....	28%	31%	29%	25%	32%	27%
Total						
Number.....	219	229	441	64	56	120
Per cent.....	100%	100%	100%	100%	100%	100%

two had a satisfactory bilateral collapse. One of these was under observation for ten weeks only, while the other, after making an excellent improvement for more than two years, died suddenly of heart failure. Accordingly, it is apparent that every patient who improved had an anatomically satisfactory bilateral collapse, while of those who were unimproved this was true of only two of eight patients.

The results with the seventy-seven patients with artificial pneumothorax, including sixteen whose treatment was bilateral, indicate, therefore, that a pneumothorax with an anatomically satisfactory collapse is an important factor in controlling the disease and that in the

absence of an anatomically satisfactory collapse improvement is not likely to occur. If this fact is borne in mind it will help to determine where useful work ends and useless work begins.

COMPLICATIONS OF PNEUMOTHORAX TREATMENT

In order to determine the advisability of pneumothorax treatment in the type of patient under consideration, it is necessary to discuss the frequency with which

TABLE 3.—Distribution of 137 Patients According to the Character of Collapse of the Diseased Lung

	White		Colored		Total	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
No collapse.....	10	7	7	5	17	12
Poor collapse.....	26	19	20	14	46	34
Good collapse.....	26	19	22	15	48	35
	15	11	11	8	26	19
Total.....	77	56	60	42	137	100

complications are apt to occur. In this series there was one instance of pleural shock. After being apparently dead the patient recovered following artificial respiration and intracardiac injection of epinephrine hydrochloride. Spontaneous pneumothorax of seven patients as a result of treatment in the hospital occurred. Two patients died of this complication, a third developed empyema and another developed a massive effusion, while the remaining three suffered no serious effects.

The most frequent complication affecting pneumothorax is adhesions between the visceral and parietal pleura. Of the 137 patients in whom pneumothorax was attempted, seventeen had no free pleural space. Of the remaining 120 patients forty-one, or 34 per cent, had adherent pleura, in most instances sufficiently extensive to interfere with satisfactory collapse. There were an equal number of patients with adhesions of clinical significance, about one third of whom received pneumonolysis. In other words, a total of seventy-eight, or 65 per cent, of those who received pneumothorax treatment had either adherent pleura or adhesions interfering, to some extent at least, with collapse. Progressive obliterative pleuritis occurred in twelve cases during the period of our observation. Preceding the adhesive pleuritis, a free pleural space had been present in four instances, while eight had been complicated by adhesions or adherent pleura.

During hospital observation fluid in the pleural cavity, sufficient in amount to be of clinical significance, occurred in twenty-two, or 18 per cent, of those receiving pneumothorax, eight of these patients requiring aspiration. In fifteen, or 12.5 per cent, of cases there was a small amount of fluid confined to the costodiaphragmatic sulcus. The total number in which fluid was noted was thirty-seven, or 31 per cent.

Cardiac embarrassment due to pneumothorax treatment not infrequently occurs, as a result either of over-collapse or of cardiac displacement. Overcollapse is more likely to occur in spontaneous pneumothorax, in bilateral collapse or in unilateral collapse in which there is insufficient functioning lung, usually due to extensive disease on the opposite side. There were three deaths due to cardiac failure. These three cases emphasize the importance of bearing in mind constantly that pneumothorax treatment does not affect the lungs alone but the cardiorespiratory mechanism. It is important not to think entirely in terms of anatomic collapse, overlooking the significance of the physiologic changes produced.

Twenty-four of the 120 patients who received pneumothorax treatment died. The causes of death may be divided into two groups: progression of the tuberculous disease, and complications arising as the result of collapse therapy. There were fifty patients whose disease continued to progress during the course of treatment. Of these, seventeen died in the hospital as a result of the progression. Of the seven patients that died of complications, four died of spontaneous pneumothorax; in two instances they had been admitted with this condition following treatment elsewhere. The three remaining deaths were due to heart failure, one following a fourth stage thoracoplasty. In other words, of the seven patients four, or 3.3 per cent of the total, died of complications resulting from pneumothorax treatment given in the hospital.

The information in the preceding paragraphs indicates that complications are relatively common among patients with advanced disease. Since complications may nullify the value of treatment, the frequency with which they occur should be taken into consideration in attempting to decide the advisability of pneumothorax treatment of these patients.

SUMMARY AND COMMENT

The principal function of local hospitals for tuberculosis is to remove from the community patients with far advanced disease, this being part of the general plan of preventing the spread of tuberculosis by isolation of sources of infection. These patients with poor prognosis present a difficult therapeutic problem. It is important to decide the extent to which treatment is advisable in order to determine the point at which useful work ends and useless work begins. Particularly in the application of collapse therapy, much time may be spent by the physician doing discouraging work that not only fails to benefit the patient but may be actually harmful.

A series of 504 patients discharged consecutively from one of the services of the Department of Tuberculosis of the Philadelphia General Hospital has been analyzed. Many of the patients were admitted in a hopeless condition, since this department of the hospital is intended to treat patients considered unsuitable for sanatorium care. Approximately 80 per cent of the tuberculous patients had far advanced disease, and more than 85

TABLE 4.—Results of Treatment Related to the Character of Collapse of the Diseased Portion of the Lung

	Number	Number Improved	Per Cent Improved
No collapse.....	26	6	23
Poor collapse.....	23	5	22
Good collapse.....	23	20	87

per cent had tubercle bacilli in the sputum. The high proportion of sputum-positive patients emphasizes the importance of a city hospital for tuberculosis in protecting the community by removing the patients most likely to spread the disease. Pneumothorax treatment was given to 120, or 27 per cent, of the tuberculous patients. Far advanced disease was present among 84 per cent and positive sputum among 88 per cent of those receiving pneumothorax treatment.

Refusal of patients to remain in the hospital constitutes one of the greatest difficulties both in the treatment of the individual case and in the protection of the community. A majority of patients remained in the hospital less than ten weeks, 87 per cent remained less

than seven months and only 6 per cent remained more than one year. Excluding those who died, 65 per cent of the colored and 40 per cent of the white patients left the hospital against advice. In Philadelphia infectious patients who are a menace to others are not compelled to enter the hospital or to remain under care. In some cities, such as New York or Detroit, enforcement of existing legislation enables the authorities forcibly to admit to the hospital and detain infectious patients who do not provide proper care for themselves at home or who conduct themselves in such a manner that they are a menace to those about them. The large number of patients who leave the Philadelphia General Hospital against advice diminishes to a considerable extent the value of the hospital as a means of protecting the community by isolation of infectious patients.

Because of the frequency of short stay in the hospital, information covering a period of more than ten weeks was available for only seventy-seven patients who received artificial pneumothorax treatment. Treatment of sixteen of these was bilateral. Improvement occurred in 47 per cent of cases in which the results of pneumothorax treatment are here analyzed. There was improvement in 25 per cent of the Negroes and in 62 per cent of the white patients.

The results of treatment depend to a large extent on the type of collapse obtained. In this series of patients with advanced disease only one in five of all patients on whom pneumothorax was attempted obtained an anatomically satisfactory collapse; there was no appreciable difference between the colored and white groups in this respect. Satisfactory results were almost limited to the small number of patients who obtained a good collapse. Improvement occurred in 87 per cent of this group, while of the four fifths having a fair space, a poor space, or no space, less than a third were improved. This was likewise true of the patients who received bilateral pneumothorax, all of the eight patients who improved having a satisfactory collapse. Accordingly, in cases in which the advisability of pneumothorax treatment is questionable, collapse may be attempted. In the event of a good space this treatment should be continued. But, in the absence of a good space, continuation of artificial pneumothorax treatment in cases of advanced disease is of doubtful value. When the space is actually poor, especially if pressure readings are unsatisfactory, continued treatment may be not only useless but actually harmful.

Complications of pneumothorax treatment occur more frequently among patients with advanced tuberculosis. In the group under discussion, 65 per cent had either adherent pleura or adhesions that interfered with a satisfactory collapse. The incidence of other complications, including spontaneous pneumothorax and pleurisy with effusion, is likewise high. Following pneumothorax treatment in the hospital, two patients died of spontaneous pneumothorax and two as the result of heart failure. An additional seventeen patients died in the hospital of progressive disease, a fact illustrating that in spite of pneumothorax treatment advanced lesions are frequently uncontrolled. Since they may nullify the value of treatment, the frequency of progressive disease and the likelihood of complications should be taken into consideration in deciding the advisability of attempting collapse therapy.

With increasing reliance on collapse therapy in the treatment of pulmonary tuberculosis, the proper evaluation of bed rest is frequently not appreciated. In cases of less advanced disease and hopeful prognosis there

is a tendency to allow more activity, while in cases of progressive disease in which the prognosis is hopeless, strict bed rest is frequently enforced, even though the physician is aware that the disease is incurable and will progress to fatal termination in spite of treatment. It would seem more reasonable to reverse this procedure. The patient with the earlier lesion and better prognosis is precisely the one for whom complete bed rest should be urged, since this may be the factor that determines whether or not the disease will be controlled. On the other hand, provided isolation is maintained, strict bed rest need not be enforced on the patient with advanced disease and hopeless prognosis, if he would be more contented with some activity.

It is not questioned that artificial pneumothorax is a very valuable method of treatment in individual cases and that it may be substituted for institutional care in cases of tuberculosis in which sputum can be rendered negative for tubercle bacilli. Its application should be restricted to suitable cases, however, and it should not be used indiscriminately in an attempt to control far advanced disease. This opinion is wholly in agreement with views recently exposed in an editorial² in THE JOURNAL. Commenting on the results of collapse therapy in Chicago, the author made it clear that pneumothorax therapy cannot be regarded as "more than a significant aid in the wider problem of the eradication of tuberculosis" and that tuberculosis control remains "largely a matter of early diagnosis and segregation."

CONCLUSIONS

1. The value of a municipal hospital for the isolation and treatment of indigent patients with advanced pulmonary tuberculosis is limited by the fact that many patients remain in the hospital for short periods only and leave against advice.

2. Lack of or failure to enforce legislation enabling authorities to admit and detain infectious patients diminishes to a large extent the value of the municipal hospital in the protection of the community from tuberculosis.

3. Since the number of patients with advanced disease for whom pneumothorax treatment is successful is relatively small, and since approximately two thirds of these remain sputum positive, pneumothorax treatment, although definitely of benefit to some patients, is not a major function of the hospital as far as the protection of the community is concerned.

4. Pneumothorax should not be attempted for patients with advanced disease when the sole reason for its application is that the prognosis is otherwise hopeless. More harm than good may be accomplished in these cases.

5. The good results of pneumothorax treatment are largely confined to those patients obtaining an anatomically satisfactory collapse.

6. Pneumothorax treatment should be attempted in every case in which this form of therapy seems to offer a chance of improvement, but if a satisfactory pneumothorax space cannot be obtained, prompt discontinuation of this form of therapy is usually advisable.

7. Patients with favorable prognosis should have complete bed rest, even though relatively little disease is present but, provided isolation is maintained, strict bed rest need not be enforced in cases of progressive disease in which the prognosis is hopeless.

Seventh and Lombard streets.

2. Collapse Therapy for Pulmonary Tuberculosis as a Public Health Measure, editorial, J. A. M. A. 113: 2241 (Dec. 16) 1932.

ALTITUDE AND ARTIFICIAL
PNEUMOTHORAX

C. H. GELLENTHIEN, M.D.

VALMORA, N. M.

Regular established commercial airlines now fly at a constant minimum altitude of 2,000 feet over the passing terrain. To get over the Rocky Mountains they have to rise to at least 15,000 feet. These high altitudes produce definite and prompt physiologic changes which may profoundly affect any patient with artificial pneumothorax.

In the normal person the pleural cavity between the chest wall and the outer sac of the lung is only a potential cavity; that is, the two surfaces are everywhere in close contact with each other and no actual space exists. The reason for this is evident, as in this potential cavity the pressure is normally negative, that is, less than one atmosphere, while the pressure within the lungs is always the pressure of the outer atmosphere. As the interior of the lungs communicates freely with the outside air through the trachea, glottis and other structures, the two surfaces are conjointly held tight against the chest wall at all times by this difference in pressure between the inside and the outside.

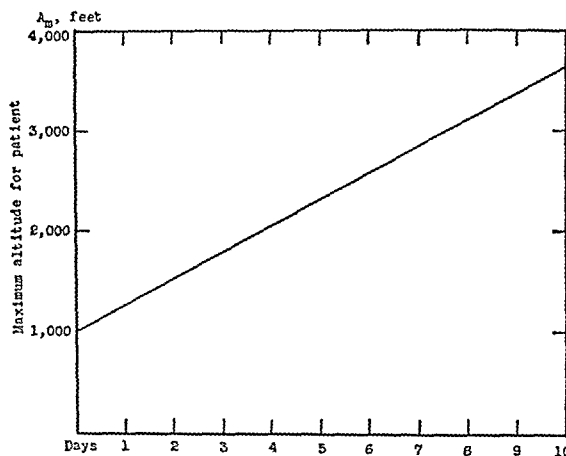
The condition resulting from the artificial introduction of air into the pleural cavity, the principle of which is well known, is called pneumothorax. Briefly, the artificial introduction of air into this potential cavity reduces the negative pressure in the cavity, eliminating the normal pressure differential between the two walls, and as there is no longer sufficient difference in pressure between the two sides of the lung sac to hold it out against the chest wall, the lung collapses. If sufficient air is introduced into the pleural cavity thus produced, the lung will collapse completely and will in effect become solid. The degree of collapse is determined by the amount of air introduced, which varies with the degree of collapse indicated and the outer atmospheric pressure. When the pressure in the pleural cavity equals that of the outside atmosphere, the lung is completely collapsed. However, obviously this condition is not stable. The air in the pleural cavity is gradually absorbed by the body, and the lung expands as the absorption takes place. The rate of absorption is not constant, and to maintain as complete a collapse as possible at all times, a fresh supply of air must be introduced at frequent intervals.

Another, and possibly more important, factor which may upset the equilibrium of a perfect collapse is the change in atmospheric pressure resulting from decided changes in altitude when traveling. As the pleural cavity is completely closed to the outside, the air introduced into this cavity must be governed by the simple gas laws as far as changes in pressure and volume are concerned. An increase in atmospheric pressure on the outside of the body, due to a reduction in altitude, acting on this air through the flexible medium of the lung, would compress the air within the lung and reduce its volume; since the pressure within the pleural cavity is affected only by the rate of body absorption, it allows the lung to expand while a new condition of equilibrium is reached. Conversely, a decrease in atmospheric pressure due to an increase in altitude would cause the air in the cavity to expand and the lung to collapse, since the pressure within the pleural cavity would then exceed the decreased atmospheric pressure within the

lung. Atmospheric pressure could be decreased without difficulty until the lung became completely solid. At this point, however, there could be no further expansion of the air without an accompanying increase in pressure above the atmospheric level because the flexibility of the lung has disappeared and the air is enclosed in a semirigid cavity. As the pressure in the pleural cavity acts directly on the heart and the other organs in the mediastinal space, any increase in pressure above the atmospheric level is apt to be critical. Not only may it cause considerable discomfort but, if allowed to go high enough, it may result in serious difficulty and even death, if the heart and other organs are not able to readjust themselves promptly.

The altitude to which one can go without expecting difficulty depends on how near the lung is to being collapsed when one starts out. If considerable time has elapsed since a fresh supply of air was introduced and the body has absorbed considerable air from the cavity, one can go up several thousand feet without difficulty.

To determine just how high one can go without obtaining a positive pressure at any given time after a



The maximum altitude in feet above sea level to which a typical patient may ascend during a ten day period after pneumothorax has been given.

fresh supply of air has been introduced into the pleural cavity, the accompanying chart was developed.

As practically all the factors which affect the maximum safe altitude are different for each individual, a separate chart must be made in each case. In making the chart, the following points must be established:

A. Altitude at which patient has been living and at which last supply of air was added to the pleural cavity.

T. Time interval for replenishing air.

v. Total capacity of pleural cavity in cubic centimeters when lung is completely collapsed.

V. Capacity of pleural cavity in cubic centimeters after absorption has taken place (varies from time to time).

P = Atmospheric pressure in inches of mercury at altitude A. (Standard sea level pressure is 29.92 inches of mercury. Reduce 1 inch for each thousand feet above sea level.)

p. Atmospheric pressure at maximum safe altitude. $p = \frac{PV}{V}$

A_m. Maximum altitude in feet above sea level to which one can go without difficulty (varies from day to day after pneumothorax has been given.)

A_m. (29.92 inches — p) 1,000.

The value v is the total capacity of the pleural cavity when the lung is collapsed.

The value V may be obtained for each consecutive day by substituting the average daily absorption from v for each day after pneumothorax has been given.

As an example of how to make calculations, let us assume that John Jones, who lives at an altitude of 1,000 feet, has a pneumothorax in his left lung. He has 400 cc. of air added to his pleural cavity every ten days. From measurements of his x-ray plate he finds his chest volume to be approximately 4,500 cc. It is assumed that the absorption of the air takes place at a constant rate of 40 cc. a day. In this case the quantities just enumerated would be:

$$A = 1,000 \text{ feet.}$$

$$T = 10 \text{ days.}$$

$$v = 4,500 \text{ cc.}$$

$$V = 4,460 \text{ cc. at end of first day; 4,420 at end of second day, and so on.}$$

$$P = 28.92 \text{ inches of mercury.}$$

The values p and A_M must be calculated as in the following examples:

At end of first day:

$$p = \frac{28.92 (4,460)}{4,500} = 28.66 \text{ inches.}$$

$$A_M = (29.92 - 28.66) 1,000 = 1,260 \text{ feet.}$$

At end of tenth day:

$$p = \frac{28.92 (4,100)}{4,500} = 26.34 \text{ inches.}$$

$$A_M = (29.92 - 26.34) 1,000 = 3,580 \text{ feet.}$$

Calculations for the entire ten day period are shown in the table.

Values at End of Each Day

Days	1	2	3	4	5	6	7	8	9	10
V	4,460	4,420	4,380	4,340	4,300	4,260	4,220	4,180	4,140	4,100
P	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92
v	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
p	28.66	28.40	28.14	27.89	27.63	27.37	27.12	26.86	26.60	26.34
A _M	1,260	1,520	1,780	2,030	2,290	2,550	2,800	3,060	3,320	3,580

These values may be graphed as in the chart, with the altitude as ordinate and the time in days as abscissa.

CONCLUSIONS

1. In pneumothorax the air within the pleural cavity is subject to the ordinary physical laws of the expansion of gas.

2. A knowledge of the application of these laws in individual cases may be valuable in determining the size of injection when changes of altitude are contemplated.

3. The method presented here is based on the measurement of the ordinary 6 foot roentgenogram of the chest combined with known data of altitude, present and contemplated, and the size of the pneumothorax injection.

Valmora Sanatorium.

Organic Acids in Foods.—The organic acids citric, malic, tartaric, oxalic and benzoic are widely distributed in common foods. Less common ones like succinic, isocitric, malonic, salicylic and quinic acids also are found in some foods. The present point of view regarding these acids is that they are not mere waste products of metabolism in either plants or animals but that they play fundamental, though as yet undefined, roles in some of the physiologic processes of the body. Some of the organic acids recognized as typical plant constituents are synthesized in the animal body and, in some instances, both the condition of their formation and their precursors are known.—Smith, Arthur H.: *Nutrition and Dietetics*, chapter I in *The Therapeutics of Internal Medicine*, New York, D. Appleton-Century Company, Inc., 1940.

ASPIRATION PNEUMONITIS

AN OBSTETRIC HAZARD

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In October 1937 one of my patients entered the Samuel Merritt Hospital in Oakland in labor at term. She was a healthy normal woman in excellent physical condition, looking forward eagerly and happily to the birth of her first child. She had an ample pelvis, the presentation was normal, and she was assured with confidence that before long her dreams would be realized.

Dilatation progressed normally, and eventually the head was bulging the perineum. The patient was given gas anesthesia for a low forceps extraction. During the course of the anesthesia she gagged and vomited and became very cyanotic. Respiration ceased. Artificial respiration was used for a few seconds and she began to breathe again. Soon her color became normal and it remained so throughout the rest of the delivery and repair. She was returned to her room in good condition, with normal pulse and respiration and no cough.

Thirteen days later she was dead, and the sorrowing husband took the baby they had both wanted so much back to an empty house.

This tragic occurrence caused me to embark on a search for similar cases to see what errors of commission or omission, if any, made such tragedies possible. A careful search of all the medical literature failed to yield a single detailed report of a similar case. The textbooks on anesthesia, as well as numerous articles, mention it as a possibility, but no case reports could be found. Not long afterward, however, I was called in consultation to see a similar case in another local hospital, and inquiry among friends in the East Bay, in San Francisco and in Los Angeles has brought reports of fourteen similar cases. How many more there have been cannot be known. The majority are not fatal and are not reported.

This article constitutes a review of this group of cases, including my own, to see whether any conclusions can be drawn from them. The physicians of these patients gave me permission to use this material.

REPORT OF CASES

CASE 1.—A primipara aged 33 entered the hospital at 1:30 a. m. in the early first stage of labor at term. Rectal examination showed no dilatation. A mixture of scopolamine, morphine and cactine (H. M. C. 1) was given at 3 a. m. so that the patient could secure some sleep. The following forenoon the pains continued to be weak and irregular. At 1:30 p. m. rectal examination showed only 1 cm. of dilatation and it was decided to try to stimulate the contractions with small doses of solution of posterior pituitary, after preliminary sedation. At 2 p. m. she was given sodium allyl (1-methylbutylbarbiturate) $7\frac{1}{2}$ grains (0.5 Gm.) by mouth and scopolamine $\frac{3}{32}$ grain (0.0004 Gm.) by hypodermic. At 2:15 p. m. 2 minims (0.12 cc.) of solution of posterior pituitary was given by hypodermic. This gave contractions which remained strong, so that no further solution of posterior pituitary was necessary. Much motor excitement developed and the patient became noisy so that morphine sulfate one-eighth grain (0.008 Gm.) was given at 3:30 p. m. By 6:30 p. m. dilatation was complete, with the head low in the midpelvis. The patient was taken to the delivery room and an attempt was made to get her to push. The head soon came in sight and it was decided to deliver the child with low forceps. Gas anesthesia was started by a trained and skilful nurse anesthetist. About four minutes

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after the start of the gas anesthesia the patient gagged and vomited. Respiration ceased and she became very cyanotic. Artificial respiration was resorted to and she soon started breathing again. Her color soon became and remained good. There was no coughing.

The baby was delivered in good condition. The patient was returned to bed at 7:30 p. m. Her pulse rate was 84 and respiratory rate 26. She was still asleep and her breathing was stertorous, but her color was good. A special nurse remained with her.

By 9:30 p. m. she was cyanotic and gasping for air. Atropine $\frac{1}{50}$ grain was given and inhalation of oxygen and carbon dioxide was started. Examination of her chest showed coarse bubbling rales throughout. Dr. Hobart Rogers, an internist, was called in consultation. Four hundred cc. of 25 per cent sucrose was given intravenously and another $\frac{1}{50}$ grain of atropine. The patient was placed in an oxygen tent, and one ampule of metrazol was ordered given every four hours.

The following morning an x-ray study of the chest was made. The radiologist reported that there was very extensive coarse mottling extending throughout the right lung, most pronounced adjacent to the hilus and gradually diminishing as the periphery of the chest was approached. The shadows were large, soft, indistinct densities following no special distribution; however, there seemed to be more pathologic change in the middle lobe. In the left side there was similar but not quite as extensive mottling, which appeared to be distributed principally in the lower portion of the upper lobe.

The blood count is reported in table 2. The remarkable thing about it was the extremely high percentage of nonfilamented forms. Throughout the day the respiratory rate even in the oxygen tent remained between 40 and 50 and the pulse rate between 110 and 140, though the temperature averaged only about 100 F. (ranging from 102 at 8 a. m. to 98.8 at 11 p. m.). One thousand cc. of 5 per cent dextrose was given during this day and also a transfusion of 680 cc. of citrated blood, it being thought that increasing the number of circulating red cells would aid the blood in its oxygen carrying capacity. The patient coughed but rarely and then raised small amounts of thick rusty sputum, which showed a streptococcus in a smear.

The patient remained continuously in an oxygen tent and was kept alive by this means for thirteen days with but little change in her clinical condition. The oxygen concentration in the tent had to be maintained at between 50 and 60 per cent with from 7 to 10 liters per minute running. Even in this atmosphere her respiratory rate was constantly between 50 and 35 per minute. Her pulse rate remained fairly stationary between 120 and 130. Her temperature oscillated between 99.6 and 101 F. except at the very end.

TABLE 1.—Pulse and Respiration in Case 1

Time, P. M.	Pulse Rate	Respiratory Rate
8	92	26
8:30	100	30
9	120	32
9:30	150	34

X-ray examinations of her chest made on four occasions showed a progressive increase in the areas of density. Blood counts were made almost daily. A second transfusion of 500 cc. was given on the eleventh day. Metrazol was given by hypodermic every four hours.

The patient died thirteen days after delivery. A partial autopsy showed both lungs full of a diffuse wet consolidation with air present only at the extreme apexes.

CASE 2.—A primipara was admitted to the hospital in active labor. Fifty minutes after admission she was given pentobarbital sodium 3 grains (0.2 Gm.), and one hour later paraldehyde by rectum. The paraldehyde was not retained and so was given again twenty-seven minutes after the first instillation. Forty-five minutes after the second instillation of paraldehyde the patient, who was having pains, was taken to the delivery room for gas anesthesia. The head came down to

the perineum and after forty-seven minutes of gas anesthesia the physician delivered the baby with low forceps. The patient vomited and became cyanotic. Her pulse rate shot up to 156. She was given oxygen inhalations, with nikethamide (coramine) and solution of epinephrine hydrochloride by hypodermic, and soon her color improved. She coughed considerably for several days. After the first few hours her pulse rate settled down to normal. Her respiratory rate was never over 24. She was treated with intermittent inhalations of carbon dioxide and oxygen. A white blood cell count on the fifth day after

TABLE 2.—Blood Counts, Case 1

Date, October	Red Cell Count	Hemoglobin, %	White Cell Count	Poly-morpho-nuclears	Non-filamented Cells
17	4,000,000	80	14,000	97	92
	Transfusion, 680 cc.				
18	.....	..	17,200	96	68
19	.....	..	16,000	93	53
20	.....	..	11,000	95	45
21	4,940,000	94	11,700	92	28
22	.....	..	11,900	85	24
23	.....	..	17,900	94	45
25	.....	..	21,600	90	39
26	4,940,000	88	26,700	90	40
	Transfusion, 500 cc.				
27	.....	..	24,400	91	36
28	.....	..	27,900	91	35
29	.....	..	17,100	96	66

delivery was 21,200 with 88 per cent polymorphonuclears and 12 stab cells. No chest roentgenogram was made. She left the hospital on the tenth day in good condition.

CASE 3.—A primipara aged 30, on whom the physician decided to do a cesarean section because of failure of the head to engage after seven and one-half hours of labor, had no analgesia until this decision was made, when she was given $1\frac{1}{2}$ grains (0.1 Gm.) of pentobarbital sodium by mouth and 1 grain (0.06 Gm.) of codeine by hypodermic. Gas anesthesia was started thirty-seven minutes after the medication. While the physicians were inserting sutures, forty-eight minutes after the anesthetic had been started, the patient vomited a large quantity of undigested food. She became cyanotic and remained so for about four hours. She coughed much and during the next few hours "raised considerable dark material similar to what she had previously vomited." The next day she had a slight cough, with sputum described as rusty. She was treated with frequent inhalations of carbon dioxide and oxygen for seven days. Her convalescence was uneventful. No blood counts or x-ray studies were made.

CASE 4.—A primipara entered the hospital apparently just beginning labor. She was given sodium amyl as shown in table 3. She thus received a total of $10\frac{1}{2}$ grains (0.7 Gm.) over a period of ten hours. With the coming of morning the physician stopped sodium amyl medication. Dilatation was progressing very slowly and he decided to accelerate labor. During the day the patient was given 10 minims (0.6 cc.) of solution of posterior pituitary in six doses. During this time the only analgesia given was $\frac{1}{4}$ grain (0.01 Gm.) of morphine at 3:30 p. m. By 7 p. m. dilatation was reported complete. At 9 p. m. the physician decided to deliver the baby with low forceps. Open drop ether was used to put the patient to sleep. Forceps were being placed on the head when the patient vomited a large amount of what was described as "coffee ground" vomitus. She inhaled some of it and ceased breathing. She was given nikethamide twice. When respirations began oxygen was given, but the patient's condition was so poor that the physician thought it best to discontinue attempts at delivery for a time. The patient was left lying on the delivery table with her head lowered; the anesthetist continued to give oxygen and carbon dioxide for two or three hours. The shocklike condition apparently caused absolute loss of tonicity in the uterine muscle. This, combined with the fact that the patient was lying with her head much lowered, caused the baby's head to fall back entirely out of the pelvis. I saw this patient in consultation about four hours after the incident. She was still dusky; her respiration was rapid and her pulse rate 140. The presenting part was far above the pelvic brim. It was thought

best to ignore the pregnancy and treat the shock for the time being. The patient was put back to bed. After some hours, uterine tone returned; the head reentered the pelvis and came down to the perineum with right occipitotransverse presentation. There it remained with the sagittal suture transverse for two hours, and it was decided that forceps must be used to rotate it and deliver the baby. The patient was given a spinal anesthetic and delivery was easily effected.

A roentgenogram of the chest taken fourteen hours after aspiration showed an area of haziness and increased density in the lower lobe of the left lung.

A white blood count taken twelve hours after the aspiration showed 22,400 cells; with 95 per cent polymorphonuclears and 45 stab cells.

During the next few days there developed symptoms suggestive of a moderately severe bronchopneumonia. The patient's

TABLE 3.—Administration of Sodium Allyl in Case 4

Dose, Grains	Time
3.....	9:40 p. m.
1½.....	11 p. m.
1½.....	Midnight
3.....	2 a. m.
1½.....	7 a. m.

maximum temperature three days after delivery was 102.6 F. By the eighth day following delivery her temperature was normal and she went home in good condition.

CASE 5.—A woman entered the hospital with pains occurring every five minutes. Five hours after admission, when her cervix was reported as dilated 4 fingerbreadths, she was given pentobarbital sodium 3 grains and one hour later scopolamine ½ grain. She was taken to the delivery room with the head showing at 1:30 a. m., five and a half hours after administration of pentobarbital sodium and four and a half hours after scopolamine. Vaginal examination showed the head to be in direct posterior position, and the physician decided to deliver it in this position with forceps. The patient was anesthetized with gas. During the delivery she began to vomit "black coffee ground material" and it was felt at the time that she had probably aspirated some of the vomitus. Her pulse rate rose to 156 and respiratory rate to 40. She was given carbon dioxide-oxygen mixture and nikethamide by hypodermic. Gradually her condition improved, although six hours later her pulse rate was still 130 and respiratory rate 24. A persistent cough developed. She was given carbon dioxide-oxygen mixture for five minutes every two hours for forty-eight hours, after which time treatment consisted of diathermy applied to her chest and administration of elixir of terpin hydrate. She did not at any time have clinical symptoms of pneumonia. No roentgenogram was taken and no white count was done.

CASE 6.—A woman was admitted to the hospital with mild pains and a 4 cm. dilatation. About one hour after admission she was given pentobarbital sodium 3 grains, and twenty minutes later scopolamine ½ grain (0.6 mg.). The same dose of scopolamine was repeated in another twenty minutes and again two hours later. The patient was delivered with low forceps under gas anesthesia eighteen minutes after her third hypodermic of scopolamine. While the physician was repairing an episiotomy the patient vomited and became cyanotic. Her head was lowered and she was given carbon dioxide-oxygen mixture and oxygen (90:10); this was continued for one and a half minutes every twenty minutes for the next thirty-six hours. She coughed up considerable vomitus. X-ray study of her chest on the day following delivery showed no involvement of her lungs. The white count the day following delivery showed 17,100 cells, 82 polymorphonuclears and 30 stab cells. Four days later it was 13,500 cells, with 80 polymorphonuclears and 13 stab cells.

CASE 7.—A primipara aged 26 began having pains at 1 a. m.; labor progressed rapidly. She was given scopolamine ½ grain (0.3 mg.) at 3:25 a. m. and pantopon ½ grain (0.02 Gm.) at 3:50 p. m. Labor progressed steadily with severe pains which did not respond well to the analgesia. After

complete dilatation, the head being on the perineum, the patient was given gas-ether anesthesia and the baby was delivered by outlet forceps. As she was coming out of the anesthesia after delivery of the baby's head the patient vomited and aspirated some of the vomitus. Respiration ceased, the heart continuing to beat slowly but strongly. Artificial respiration was used. One cc. of nikethamide was administered intravenously and 1 cc. of solution of epinephrine hydrochloride was injected into the cardiac muscle. Gradually the heart became weaker and death ensued.

Autopsy showed both lungs collapsed and the bronchi of each lung filled with dark colored contents, apparently spinach or some other dark food.

CASE 8.—A woman entered the hospital at 2:20 p. m. saying that she had been having pains for ten hours. The contractions were very weak and it was questioned whether she was in true labor. About 7 p. m., however, pains became strong and definite. At 8 o'clock she was given scopolamine ½ grain. At 9 o'clock this medication was repeated with addition of pentobarbital sodium 3 grains (0.18 Gm.). Ether was also given rectally at this time but was not retained. At 9:30 the patient was taken to the delivery room and administration of gas and oxygen was started, the anesthesia being given by a physician specializing in anesthetics. The membranes were ruptured artificially and the baby was delivered with low forceps at 10:07 p. m. The patient vomited during delivery. After the repair, her stomach was washed out until clear. Carbon dioxide-oxygen mixture was given for ten minutes every hour until the following morning. On the following day the patient stated that she felt fine. The temperature was normal. However, the respiratory rate was 32; she had an occasional thick cough, and there were scattered rales over the lower lobes of both lungs posteriorly, especially on the left. Two days later the cough was somewhat worse, with pink tinged expectoration. The temperature was only 99.2 F. but examination of the chest revealed increased voice sounds with coarse and fine rales at the base of the left lung. The patient was discharged fourteen days after delivery with normal temperature and respiration. She still had some cough. She was hoarse for at least six weeks and could not smoke comfortably for some months, although previously she had used about one pack of cigarettes a day.

CASE 9.—A woman entered the hospital after having had pains for twelve hours at home. The cervix was dilated from 5 to 6 cm. on admission; pains occurred every five minutes, lasting from thirty-five to forty seconds. The baby was in breech presentation. After routine preparation she was given

TABLE 4.—Blood Count in Case 9

Days Post Partum	White Cell Count	Polymorphonuclears	Non-segmented Cells
2	34,900	95	19
5	23,700	87	45
9	13,400	67	9

pentobarbital sodium 4½ grains (0.3 Gm.). The baby was delivered about three and one-half hours later. During delivery the mother vomited a quantity of yellow liquid and probably aspirated some of it. She began to cough immediately and for the next few days her cough was very distressing. Two hours after delivery it was noted that she was raising "pink frothy material"; on the following morning considerable bloody mucus was being expectorated. The respiratory rate eight hours after delivery was 30 and the pulse rate 140. Twenty-four hours after delivery the pulse rate was still 140 and the respiratory rate 32. Her face and hands were very cyanotic, and nasal administration of oxygen was started. This was kept up continuously for the next three days, after which it was discontinued, although the respiratory rate was still 32 and the pulse rate 110. This patient remained in the hospital for eighteen days. Her temperature during most of this time was about 100 F. It never went over 101 and was still going to 99.6 on the eighteenth day post partum. The pulse rate never fell below 100 until the eleventh day post partum. She was seen in con-

sultation by an internist, Dr. Philip Pierson, who found scattered crepitant rattling and wheezing rales over the lower and middle lobes of the left lung. Roentgenograms of the chest made on the eighth and the fourteenth day post partum were reported as showing evidence of diffuse bronchopneumonia.

Sputum examination six days post partum showed a moderate number of pus cells within a few gram-positive diplococci. On culture, the sputum revealed *Streptococcus viridans* and a non-hemolytic streptococcus.

CASE 10.—A primipara aged 21 was delivered by outlet forceps after twenty-seven hours of labor. There is no record of the analgesia that was used in this case. The anesthetic for delivery was gas-ether, given by a nurse anesthetist. The patient vomited just prior to delivery and the physician states that there was a large amount of undigested food. This patient's chart showed no marked effect on her temperature, pulse or respiration until about twenty-four hours after delivery. At about that time the temperature began to rise steadily, reaching a peak of 103.4 F. on the fourth day post partum (the highest temperature recorded in this series); thereafter it gradually fell to normal. Her pulse rate rose to 120 about twenty-four hours after delivery and remained between that point and 150 during the next three days. Her respiratory rate was not noted as elevated until about forty-eight hours after delivery, but it reached 46 on the fourth day post partum, at the time of her greatest fever. She complained of shortness of breath and irritation in the trachea on forced inspiration. X-ray study of her chest on the fourth day post partum showed some density in the lower lobe of the left lung behind the heart shadow, very suggestive of a small amount of pneumonitis. This patient left the hospital on the eleventh day, still having a low grade afternoon fever, which the physician attributed to her chest condition.

CASE 11.—A primipara aged 32 had labor pains at 5 p. m. just after eating a large bowl of vegetable soup. The pains were severe and close together. The progress of labor was rapid. By 9:20 p. m. the cervix was fully dilated. When the head came down to the perineum a low forceps delivery was done. The patient took the anesthetic poorly and vomited a large amount of acid fluid, probably the soup. Although the anesthetic was given by the chief anesthetist of the hospital, aspiration was considerable. There was moderate laceration of the perineum, which was repaired immediately. One hour post partum the patient was not in great distress but could not sleep because of headache and cough.

At 8 o'clock the following morning the patient was cyanotic and coughing. Beginning pneumonia was diagnosed by a well recognized internist. By 5:30 p. m. cyanosis was extreme. The respiratory rate was from 50 to 55 per minute and the pulse rate from 128 to 148. Examination showed that the lungs were full of fluid. Considerable frothy blood stained fluid was constantly being expectorated. Atropine $\frac{1}{400}$ grain was given and the dose was repeated without apparent effect. A venesection of 400 cc. was done without improving the patient's condition, which grew rapidly worse. She died at 8:35 p. m., about twenty-two and one-half hours after the aspiration.

CASE 12.—A woman decided during dinner that she would like to have her baby that evening. After dinner she went to the hospital, where the baby was delivered by classic cesarean section. She was at term but not in labor. Gas-oxygen anesthesia was used. The patient started vomiting shortly after the baby was delivered. Respirations ceased; although her heart continued to beat for some time, breathing could not be started. There was no autopsy.

CASE 13.—A patient was delivered by cesarean section after a twenty hour test of labor. During this twenty hours she received 15 grains (1 Gm.) of pentobarbital sodium (6 grains [0.4 Gm.], 3 grains, [0.2 Gm.], 3 grains, 3 grains) and $\frac{1}{200}$ grain (1.2 mg.) of scopolamine ($\frac{1}{200}$ grain with each dose of pentobarbital sodium). There was a face presentation. When the decision to do a cesarean section was made an additional $\frac{1}{200}$ grain of scopolamine was given. The anesthesia used for surgical intervention was cyclopropane; the anesthetist was a trained and skilful physician. The vomiting occurred just after skin closure. The patient's head was slightly lower than the rest of her body at this time. The only immediate treatment

consisted of turning the head to one side and wiping the face. There was no immediate reaction. The temperature at the time of operation was 37.5 C. (99.5 F.) and five hours later rose to 38.5 C. (101.3 F.). After pursuing an irregular course, it reached 40.4 C. (104.7 F.) on the fourth postoperative day. From this point the trend was irregularly downward, the value reaching normal, to remain there, on the thirteenth postoperative day. The pulse rate rose from 90 at the time of operation to 132 five hours later, reached its high point of 140 in fifteen hours and thereafter ranged irregularly downward, becoming normal on the nineteenth day. The respiratory rate was 18 before operation, rose in eight hours to 24, ranged between 20 and 24 during the next twenty-four hours and reached 32 during the succeeding twenty-four hours. At the end of the third postoperative day it reached 48. It varied between 32 and 48 during the next forty-eight hours, after which it varied between 20 and 28. The rate came down to an essentially normal level on the eighth postoperative day.

X-ray study on the fifth postoperative day showed some consolidation in the lower lobes of both lungs, more on the right side. On the eleventh postoperative day x-ray examination still showed some consolidation, though less, with a high diaphragm; on the eighteenth postoperative day both lungs looked clear.

Blood culture on the fourth postoperative day yielded no growth.

Sputum examination on the fourth day after operation revealed large numbers of *Staphylococcus aureus* and moderate numbers of *Streptococcus viridans* with a few nonhemolytic streptococci. A white mouse which was inoculated was normal after seventy-two hours. The Neufeld test was negative.

CASE 14.—A primipara aged 22 was in perfect physical condition. Labor started spontaneously. The first stage lasted twelve hours. There is no note on the record as to what analgesia was used. With the head on the perineum the patient was taken to the delivery room for prophylactic forceps. She had had no solid food for twenty-two hours. Gas and oxygen anesthesia was given by an intern with limited anesthetic training. About two minutes after the induction of anesthesia the patient began to vomit and became cyanotic. Anesthesia was stopped and the patient turned on her side to aid removal of vomitus. Cyanosis increased and respiration ceased. Suction was used to remove particles of undigested food, which must have been eaten at least twenty-two hours previously. All efforts at artificial respiration, including a pulmotor, failed, and heart action ceased. No forceps were applied until the mother's pulse ceased. Efforts to resuscitate the baby, delivered post mortem, failed. There was no autopsy.

CASE 15.—This case represents the only aspiration in the series not occurring at the time of delivery. A woman aged 35 entered the hospital one afternoon for an operation to remove what turned out to be a dermoid cyst of the ovary. She was operated on the following morning after careful preoperative preparation. The anesthetic was being given by a trained nurse anesthetist. The abdomen was opened through a midline incision. While packs were being placed in the abdominal cavity the patient vomited what looked like orange juice. Directly thereafter pinkish foam began to issue from her nose and mouth, the color soon changing to dark brown.

The anesthetic was stopped and her mouth was cleared. When she seemed in good condition the anesthetic was resumed and the operation proceeded. About forty-five minutes later, when the surgeon was about ready to close the wound, the patient became cyanotic; her pulse was rapid and irregular, and her blood pressure dropped to 60 systolic. A stomach tube was then passed, and more orange juice and gastric secretion were obtained. Atropine $\frac{1}{25}$ grain (0.0008 Gm.), and 1 cc. of a solution of epinephrine hydrochloride were given by hypodermic, and 60 cc. of 50 per cent dextrose was given intravenously. While the surgeon was closing the wound the patient ceased breathing several times. She was given carbon dioxide and oxygen and eventually was returned to bed in fair condition. Inhalations of carbon dioxide and oxygen were kept up for five minutes every four hours for the next thirty-six hours. There developed a troublesome cough, which was treated with codeine and steam inhalations. The pulse varied between 100

and 120 for the next five days. Five days after operation there was dulness over the entire base of the right lung. The white blood cell count was 8,750 with 71 per cent polymorphonuclears. The patient was raising much sputum containing many elastic fibers, a few gram-positive cocci and occasional red blood cells. On the seventh day she was still coughing with violent paroxysms and raising thick purulent material. Her respiratory rate

TABLE 5.—*Analgesia and Vomiting*

Case	Analgesia	Elapsed Time Before Vomiting
1	Mixture of scopolamine, morphine and eactine (H. M. C. 1).....	15½ hr.
	Sodium allyl, 7½ grains }.....	5 hr.
	Scopolamine, 1/150 grain }.....	3 hr.
	Morphine sulfate, ¼ grain.....	3 hr.
2	Pentobarbital sodium, 3 grains.....	3 hr.
	Paraldehyde, 4 ounces (rectal).....	1½ hr.
3	Pentobarbital sodium, 1½ grains }.....	85 min.
	Codeine, 1 grain.....	
4	Sodium allyl, 10½ grains in divided doses over 10 hr. period (time between last dose and vomiting).....	14 hr.
	Morphine sulfate, ¼ grain.....	5½ hr.
5	Pentobarbital sodium, 3 grains.....	5½ hr.
	Scopolamine, 1/150 grain.....	4½ hr.
6	Pentobarbital sodium, 3 grains.....	3 hr.
	Scopolamine, 1/100 grain.....	2½ hr.
	Scopolamine, 1/100 grain.....	2 hr.
	Scopolamine, 1/100 grain.....	18 min.
7	Scopolamine, 1/200 grain.....	2½ hr.
	Pantopon, ½ grain.....	2 hr.
8	Scopolamine, 1/200 grain.....	2 hr.
	Scopolamine, 1/200 grain.....	1 hr.
	Pentobarbital sodium, 3 grains.....	
9	Pentobarbital sodium, 4½ grains.....	1 hr.
10	No record	
11	No record	
12	No record	
13	Pentobarbital sodium, 15 grains in 4 doses.....	During 20 hr. test of labor
	Scopolamine, 4 doses of 1/200 grain.....	
	Scopolamine, 1/150 grain.....	
14	No record	Shortly before operation
15	No record	

was 20 and her pulse rate 100; her white cell count was 12,600 with 72 per cent polymorphonuclears. A roentgenogram taken this day showed the picture of bronchopneumonia on the right; the left lung was clear. She left the hospital in good condition on the eighteenth day.

COMMENT

From a study of this series of cases several things become apparent:

1. Aspiration pneumonitis is not a rare condition. These cases were collected merely by making inquiry among a circle of medical acquaintances, twelve of them occurring within the last two years. As to how many other cases there may have been one can only speculate.

2. The condition is serious. In these fifteen cases there were five deaths, while several of the other patients required prolonged hospitalization.

3. There are two types of cases: those in which the material aspirated is of a solid nature and those in which it is fluid. In the first group, death may result rapidly from mechanical obstruction of the air passages or it may be due to the same type of shock which causes sudden death in cases of arterial embolism, even when the fraction of the total lung tissue involved is relatively small. When the aspirated material is of a fluid nature it seems to set up a chemical pneumonitis. The x-ray picture may be that of bronchopneumonia, but there are clinical criteria which are different; viz., the temperature reaction is not so high; cyanosis is more marked; the pulse and respiration are apt to be more rapid; the sputum is more pronounced, and the bacteria are apt to be secondary invaders. Possibly the chemical reaction creates an environment unfavorable to bacterial

growth. Possibly the character of the fluid aspirated is of little importance; I feel that the reaction in lung tissue is set up by certain fractions of the gastric juice itself and that whether this juice is mixed with soup or orange juice, milk, or water may make little difference. Clinically the picture is different from that of bronchopneumonia.

4. Fourteen of the fifteen women were in the act of parturition. Three of these were being delivered by cesarean section; one had a breech extraction, all the rest being delivered by low forceps. Is aspiration pneumonitis primarily an obstetric complication and if so, why? Is there some factor of pressure on the pelvic floor which makes women especially prone to vomit and inhale deeply, or does this complication occur just as frequently in the practice of general surgery? It has been suggested that the surgical patient is apt to be more carefully prepared for anesthesia than a woman in labor. During the World War I gave many anesthetics in an evacuation hospital in France where pre-operative preparation was nil. I never saw or heard of a case of aspiration pneumonitis, but I have made no study of the statistics in the Surgeon General's Office.

5. Does the type or amount of premedication, the analgesia used during labor, have any effect on this condition? Table 5 has been prepared to study this factor.

A specialist in nose and throat work who makes frequent use of the bronchoscope and esophagoscope has informed me that he does not believe it would be possible to give enough barbiturate to abolish the gag reflex.

6. Is the blame for aspiration pneumonitis to be placed on the anesthetist? I do not believe it is, although, if the anesthetist is keenly alert, the amount aspirated may be reduced to a minimum.

The anesthetist and type of anesthesia in the cases here reported are indicated in table 6.

Whether anything can be done to prevent this unfortunate complication I am not prepared to say. Probably women in labor should not be given much to eat. If there were no solid material in the stomach, the chance of aspiration of chunks of food which might mechanically obstruct the air passages would be

TABLE 6.—*Type of Anesthesia*

Anesthetist	Number of Cases
Physician specialist in anesthesia.....	2
Intern.....	2
Trained nurse anesthetist.....	6
Delivery room nurse not especially trained in anesthesia.....	3
Unknown.....	2
Anesthetic	Number of Cases
Gas-oxygen.....	8
Gas-ether.....	2
Ether only.....	1
Cyclopropane.....	1
Unreported.....	3

reduced. But the stomach at this time is often slow in emptying itself, and the material regurgitated may have been eaten hours before the onset of labor. Furthermore, several of these patients vomited only fluid; and if the hypothesis is correct that the chemical reaction in lung tissue is set up by some factor in the digestive juices themselves, the presence or absence of food diluting those juices might make little difference.

Certainly every delivery room ought to be equipped with an efficient suction apparatus kept constantly ready

for instant use. Possibly anesthetists should not be permitted to fasten the gas mask on the patient's head, as one sometimes sees them do, since its removal may cause the loss of precious seconds if it becomes filled with vomitus. Possibly all delivery tables should be so constructed that the patient's head could be promptly lowered should vomiting occur, to facilitate escape of the vomited material; and yet in one case (case 13) the head was lowered at the time aspiration occurred.

SUMMARY

Of a series of fifteen cases of aspiration pneumonitis, five resulted in death; fourteen of them concerned women who were being delivered of a baby. A study of these cases fails to disclose any factor which was present in enough instances to make it seem a predisposing cause. Some measures may help prevent it. The treatment at present is purely symptomatic.

In reporting this series of cases I hope to arouse the interest of others who may help solve the question as to how frequently this unfortunate accident occurs in general surgery or whether it is chiefly an obstetric hazard.

411 Thirtieth Street.

THE INCIDENCE AND MECHANISM
OF BILATERAL PLEURAL
EFFUSIONS

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The simultaneous occurrence of bilateral pleural effusions is rare except in cardiorenal disease and as a direct complication of bilateral artificial pneumothorax used in the treatment of pulmonary tuberculosis. In comparison there is a relatively high incidence of unilateral tuberculous effusions occurring spontaneously or in connection with artificial pneumothorax, as shown in a study of 700 cases studied at the Department for Diseases of the Chest of the Jefferson Hospital and of an additional series from one service of the White Haven Sanatorium. According to the past histories there had been 108 pleural effusions and following entry 151.

Concerning the group of effusions observed during hospitalization, ninety-two were definite complications of artificial pneumothorax, of which fourteen cases were bilateral, the fluid having developed somewhat in relation to the progression of the pneumothoraces; in three cases of bilateral pneumothorax the fluid was limited entirely to one pleural cavity. Five patients with effusions of one pleural cavity following pneumothorax had subsequent development of fluid on the opposite side but only after the primary collection had disappeared. Similar conditions were noted by Charr¹ in a series of 100 tuberculous patients treated with unilateral artificial pneumothorax; there was no instance of fluid occurring simultaneously in the opposite pleural cavity. A case studied by Theodos² at the Sea View Hospital should be mentioned: For several months a pleural effusion had been present on one side and finally as spontaneous absorption occurred an effusion appeared

in the opposite pleural cavity and subsequently ascites; x-ray study of the spine showed early Pott's disease; the sputum was negative for tubercle bacilli. It was the impression in this case that the second pleural effusion was due to hematogenous tuberculosis. These figures illustrate the relative high incidence of pleural effusions in pulmonary tuberculosis, especially as complications of the artificial pneumothorax; likewise they indicate that effusions rarely occur simultaneously in the opposite or untreated pleural cavity. The data serve as a basis for considering the mechanism of bilateral collections in certain cases of unilateral pulmonary collapse in which reexpansion of the lung has been attempted, the subject of the present paper.

During the past two years four patients have been discovered with moderately advanced pulmonary tuberculosis manifesting unusual developments of pleural fluid. Three patients had been receiving artificial pneumothorax treatments on the right side; the fourth was treated on the left side. Collapse of the lung was inadequate, and it was decided to allow reexpansion so that thoracoplasty or some other form of compression therapy could be tried. After several weeks of conservative treatment without any noticeable change in the contour of the lung, forceful intrapleural suction was tried. With each attempt there was severe pain in the chest with weakness and marked dyspnea, and subsequently fluid developed in the opposite pleural cavity. In the fourth case, with marked retraction of the lung on the pneumothorax side due to apical adhesions and fibrosis, suction was employed less strenuously but severe reactions also occurred. Within about twenty-four hours x-ray examination showed a spontaneous pneumothorax and pulmonary emphysema and subsequently the gradual development of pleural fluid. The fifth patient was a woman 32 years of age who had received unilateral artificial pneumothorax treatments empirically on the left side for the persistent formation of pleural fluid of unknown etiology.³ After about two years of unsuccessful control pneumothorax was discontinued. The lung failed to reexpand and there was no essential retardation of the fluid; then reexpansion of the lung was attempted by means of pleural suction. With each induction of negative intrapleural pressures (—15 to —22) there was severe pain in the chest with extreme dyspnea, displacement of the heart and herniation of the mediastinum toward the affected side; after the third attempt a transudate, which later became an exudate, suddenly developed on the opposite side. Dyspnea continued until the pleural pressures were reduced and equalized on the two sides. Subsequently the condition was proved to be cancer of the pleura, metastasis having originated from a new-growth of the ovary.

The remarkably low incidence of bilateral pleural collections of fluid occurring simultaneously except in bilateral pneumothorax has suggested the possibility that some mechanical factor is responsible, perhaps at first in disturbing the adhesive tension of the pleura and later in causing a rupture of a pleural tubercle leading in turn to spontaneous pneumothorax with its irritating and infecting influences on the pleura. The groundwork for such pleural complications is shown grossly in thoracoscopic studies of pneumothorax cases by Alexander,⁴ Willauer⁵ and others. They have

From the Department for Diseases of the Chest of the Jefferson Hospital.

Read before the Association of American Physicians, Atlantic City, N. J., May 2, 1939.

1. Charr, Robert: Personal communication to the author, 1939.

2. Theodos, Peter: Personal communication to the author, 1939.

3. Packard, J. S., and Gordon, Burgess: Bilateral Pleural Collections of Fluid, *Am. J. Roentgenol.* 40: 859 (Dec.) 1938.

4. Alexander, John: *The Collapse Therapy of Pulmonary Tuberculosis*, Springfield, Ill., Charles C. Thomas, Publisher, 1937.

5. Willauer, George: Personal communication to the author, 1939.

repeatedly found tubercles of the pleura in all stages of progression and reaction. In not a few instances the formations are greatly increased at the base of adhesions, illustrating the traumatizing influences of cough and of forceful respirations. Thus it would seem that in almost every tuberculous lung with subpleural tubercles there are potentialities for greatly increased pulmonary disease and accordingly the complications of spontaneous pneumothorax and pleural fluid. Likewise any complication of the pleural cavity will be more or less continuously aggravated by reason of the fact that lymphatic drainage from the pleural portion of the lung is directed toward the pleura.

Evidently the exudative pleuritides are more common with than without pneumothorax, and inflammation may develop and extend rapidly in loose tissue and on the free pleural surfaces. Conversely, while the pleurae continue in normal apposition any tuberculous lesion will tend to develop in the form of local granuloma or as a small exudate which is quickly localized. Furthermore, with the pleurae in contact the absorption of exudates will be encouraged by the normal respiratory movements. This pathologic and physiologic relationship is illustrated in Charr's¹ cases in which autopsy was performed, openings being found in the anterior surfaces of the lungs, in the center of large and acutely caseous tubercles, measuring approximately 1.5 cm. in diameter. The visceral pleura covering the caseous nodules, either ruptured or intact, was thin and transparent; when the air was pumped into the main bronchi the intact visceral pleura covering these caseous nodules ballooned out remarkably. While the caseous nodules were numerous on the anterior surface of the lungs, the posterior parts showed marked congestion with areas of pneumonia but without any definite adhesion of the adjacent parietal pleura, thus indicating a fulminating form of tuberculosis. In seven other cases the perforations occurred in the axillary region of the lungs, about midway between the apex and the lower border of the upper lobe, and there was no indication of any perforation through caseous tubercles. Furthermore, there was much pleural thickening about the ruptured areas; the pulmonary tuberculosis was chronic and proliferative. These cases illustrate the possibilities and dangers of pleural complications, e. g. pneumothorax and fluid. It is quite conceivable that the rupture of tubercles and tearing of adhesions are immediately responsible for the intrapleural developments.

According to the present consideration the normal apposition of the pleural surfaces with restricted thoracic movements and undisturbed pulmonary and mediastinal structures is a factor in the prevention of spontaneous pneumothorax and pleural fluid. There is a good deal of discussion as to whether or not a negative intrapleural pressure exists with the pleural surfaces in normal apposition, i. e. without the induction of artificial pneumothorax. Brauer⁶ insists that negative intrapleural pressure is essentially a manifestation of pneumothorax and that the physical force of cohesion between the pleural leaves is sufficient to balance the elastic retraction of the lung. In any event the lung almost fills the thoracic cage, which promotes a mechanical contact of the pleura. The important point as far as pneumothorax is concerned in its relation to the development of pleural fluid is not so much the absence

of negative intrapleural pressure as the loss of pleural apposition throughout. Concerning the effects of fluid in one pleural cavity on the development of fluid in the opposite pleural cavity there appears to be no influence except as to prevention. Evidently the pleural surfaces of the expanded lung on the side opposite the effusion will be opposed with even greater security than normally by reason of the compressive action of the displaced mediastinum and lung. Conversely, the forceful traction or expansion of the collapsed lung as induced by a high negative intrapleural pressure will shift the mediastinum and stretch the opposite lung, thus separating its hitherto opposed pleural surfaces. The events are these: Air and fluid will pass spontaneously or be sucked into the pleural cavity.

There is the possibility that some mechanism other than separation of the pleura with spontaneous pneumothorax may be responsible for the development of pleural fluid. Heart failure, hypostatic congestion and pressure on the azygos veins should be considered. In the present study there was no evidence of disturbed circulation, and the manifestations were relieved promptly with the adjustment of the intrapleural pressure. While displacement may have caused pressure effects on the azygos veins, the shifting was much less marked than is seen in a considerable number of cases of pneumothorax and pleural effusion in which the opposite pleural cavity is not disturbed. On the other hand the transudate which preceded the exudate in the carcinomatous case suggests that blood was sucked first from the fine capillaries into the newly created pleural space. Likewise the occurrence of pulmonary rales and a friction rub in association with pain, dyspnea and the x-ray evidence of mediastinal herniation just prior to the development of fluid emphasize the possibility that "suction" was an important factor.

The immediate symptoms noted during attempts to reexpand the contracted lung may be related to separation or pulling of the pleurae, wrenching or distortion of the mediastinal structures and the interference with pulmonary ventilation, the former two causing thoracic pain, the latter favoring dyspnea. Shortness of breath may be attributed to two factors: Decrease of the vital capacity due to the bilateral pulmonary compression and, perhaps more directly, the gradual bilateral rise of intrapleural pressures, the latter becoming less and less negative—that is, tending to become positive, owing to the proportionate increase of fluid. Since cohesion of the pleural surfaces is lost with the onset of fluid there is no suction to counterbalance the normal elastic retraction of the lungs and thus the respiratory movements proceed in a restricted manner. Instead of the pressure becoming more and more negative as the thorax expands normally, which would cause an inspiratory rush of air, the pleural pressure increases to a point at which it becomes so positive that the inspiratory passage of air is impossible. This was proved repeatedly with the carcinomatous patient, from whom various amounts of fluid were removed, after which the intrapleural pressure was changed alternately by withdrawing or introducing air, the purpose being to cause the variation to range between subatmospheric and atmospheric levels.

CONCLUSIONS

1. A series of 259 cases of pleural effusion was studied to determine the frequency of spontaneous, simultaneous bilateral collections of fluid; there was no instance of this particular development.

6. Brauer, Ludolph, and Spengler, Lucius: Die operative Behandlung der Tuberkulose, in *Handbuch der Lungentuberkulose*, ed. 2, Leipzig, Johann Ambrosius Barth, 1919, vol. 3, p. 170.

2. Simultaneous bilateral effusions were noted in four cases of pulmonary tuberculosis and in one case of pleural new growth in which intrapleural suction had been substituted for unilateral artificial pneumothorax on the originally treated side.

3. The present study suggests that the occurrence of fluid in the opposite, or untreated, pleural cavity in cases of artificial pneumothorax is closely related to intrapleural suction used to reexpand the contracted lung.

4. The mechanical displacement of the mediastinum and stretching of the opposite lung causes a separation of the pleura, rupture of pleural lesions and the subsequent development of fluid.

5. The study emphasizes the need for great caution in dealing with the long-contracted lung.

6. The lung should be allowed to expand slowly under the control of reduced artificial pneumothorax, and with its failure to expand a thoracoplastic operation should be performed in order to bring the pleural surfaces into apposition.

1832 Spruce Street.

CLINICAL STUDIES OF PRIMARY CARCINOMA OF THE LUNG

AN ANALYSIS OF SEVENTY-FIVE CASES, TWENTY-
ONE OF WHICH WERE TREATED BY PNEU-
MONECTOMY OR LOBECTOMY

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Before a disease entity can be satisfactorily brought under control, the medical profession as a whole must become interested in the disease. In order to arouse interest in the condition, it must be shown that the occurrence is frequent enough to be of practical importance and that something can be offered in the way of efficient therapy. It is our purpose in this paper to show that primary carcinoma of the lung is a disease that deserves this interest. Consideration will be given to its incidence, its early clinical manifestations, the available methods of diagnosis and treatment, and the results of a clinical analysis of seventy-five cases, in twenty-one of which treatment was either by lobectomy or by pneumonectomy.

INCIDENCE

The lung can now be shown to be a common, rather than a rare, site for the development of a primary malignant growth. Autopsy material from general hospitals, where admissions are unselected, is the most reliable source of data on the relative frequency of fatal diseases. A study of 52,305 recently collected autopsy reports (table 1) reveals that approximately 10 per cent of all primary cancers originate in the lungs. The incidence in the various groups ranged between 6.3 and 18.5 per cent. It is startling to learn that in the group of 7,685 consecutive autopsies done in the Cleveland City Hospital and reported by Koletsky,¹ the lung was the second most frequent site of origin of primary malignancy, being exceeded only by the stomach. Also

in the series of 6,800 autopsies reported from the Cook County Hospital, Chicago, by Jaffé,² the lung was in third place, the stomach being first, and the intestine second.

Graham³ has tabulated autopsy reports from various European and American hospitals which have appeared during the past twenty-five years. In all but one report the increase in the frequency of cancer of the lung was striking. In a total of 62,802 necropsies the percentages of primary lung cancers to all cancers were reported (table 2). Simons⁴ has clearly shown that the high incidence of lung cancer today is due both to a relative and to an absolute increase in frequency.

The numerical importance of the problem becomes apparent when it is appreciated that approximately 15,000 people in the United States die each year from cancer originating within the lung. This estimate is based on the statistical study by Dublin,⁵ who finds that approximately 150,000 persons die from cancer of all types each year. Since 10 per cent of all cancer deaths are due to primary carcinoma of the lung, it is fair to estimate the toll from this disease at 15,000 a year.

FAILURE OF IRRADIATION

The only weapons available today in the fight against cancer are radium, x-rays, fulguration and surgical excision. All forms of irradiation have up to the present time failed completely as curative agents. Graham and his associates³ have been unable to find record of a single verified case of a five year cure by this method of treatment. Furthermore, they conclude that high voltage roentgen therapy does not prolong the lives of patients with carcinoma of the lung, because the great majority of the tumors are radioresistent. Our own experience with irradiation has also been disappointing. We have not obtained a single cure by means of this treatment. Also a study of life expectancy of inoperable patients revealed that, on the average, the patients who received high voltage roentgen therapy lived only two thirds as long as untreated patients. The average duration of life in the two groups is shown in table 3.

The failure of irradiation is not surprising, since the majority of lung cancers are situated in the stem bronchi, which places them anatomically as near the center of the body as it is possible for them to be. Thus deliverance of a dosage sufficient to destroy the tumor without irreparable damage to the surrounding tissues is practically impossible. Also pulmonary infection frequently follows bronchial occlusion by the primary growth. In such instances irradiation will often aggravate the inflammatory processes and actually shorten life rather than prolong it. At the present time we believe that the results do not justify the use of high voltage roentgen therapy in any operable case. The same holds true in any inoperable one complicated by pulmonary suppuration, except possibly in an attempt to relieve pain. Irradiation is being given further trial in those inoperable cases presenting no evidence of associated infection.

The intrabronchial insertion of radium for lesions in a stem bronchus and thoracotomy with direct insertion of radon seeds into peripherally located tumors has been

2. Jaffé, R. H.: The Primary Carcinoma of the Lung, *J. Lab. & Clin. Med.* 20: 1227 (Sept.) 1935.

3. Graham, E. A.; Singer, J. J., and Ballou, H. C.: *Surgical Diseases of the Chest*, Philadelphia, Lea & Febiger, 1935.

4. Simons, E. J.: *Primary Carcinoma of the Lung*, Chicago, Year Book Publishers, Inc., 1937.

5. Dublin, L. I.: Statistics on Morbidity and Mortality from Cancer in the United States, *Am. J. Cancer* 29: 737 (April) 1937.

From the New England Deaconess Hospital.

1. Koletsky, Simon: Primary Carcinoma of the Lung, *Arch. Int. Med.* 62: 636 (Oct.) 1938.

recommended by Edwards.⁶ Beneficial effects were reported in the way of canalization of the bronchus, local disappearance of the tumor, as seen bronchoscopically, and symptomatic improvement. Specific case reports with histologic data were not given. It was admitted, however, that end results as regards cure were necessarily poor.

TABLE 1.—Incidence of Primary Carcinoma of Lung in Autopsies

Author Reporting Cases	Reference	Total Number of Autopsies	Total Number of Carcinomas	Number of Primary Carcinomas of Lung	Percentage of Lung to Total Carcinomas
Jaffé.....	2	6,800*	876	100	11.4
Jaffé.....	2	4,500	...	...	10.7
Koletsky	1	7,685	1,064	100	9.4
Frissell and Knox....	10	2,415	442	38	8.5
Matz.....	14	7,398	1,167	160	13.7
Various authors reported by Simons	4	30,307	.....	...	6.3 to 18.5

* Not included in total of 52,305 because it is included in the cases reported by Simons.

We have not considered the evidence supporting the use of radium in treating cancer of the lung convincing enough to justify its use. On theoretical grounds the danger of increasing bronchial obstruction and aggravating the associated suppurative processes far outweighs the remote chance that the tumor would be destroyed or even retarded in its growth. None of the patients in our series have been treated in this way. Treatment of primary carcinomas of the lung by endobronchial fulguration has been reported. Some of the so-called cures by this method have been in cases in which the identity of the tumor was mistaken. It is theoretically possible for a primary cancer, occurring as a small papillary intrabronchial tumor, to be completely removed by this method. Such cases from a practical standpoint, however, are extremely rare. In our experience we have seen but one instance in which the tumor was apparently completely removed bronchoscopically with no evidence of recurrence during a two year period. In every case in our series in which surgical excision was carried out the tumor was found

TABLE 2.—Percentages of Primary Lung Cancers to All Cancers in Autopsies (Graham³)

Year	Per Cent
1896-1901.....	0.54
1902-1916.....	5.02
1914-1919.....	6.36
1920-1925.....	10.30

to have extended through the bronchial wall into the parenchyma of the lung. Obviously, endobronchial therapy would not have been suitable in any of these cases.

DEFINITE HOPE OFFERED BY SURGERY

Fortunately the outlook for the patient with primary carcinoma of the lung now appears to be much brighter, owing to the introduction of surgical excision of lung tissue as a practical therapeutic procedure. The place that this form of treatment will ultimately take in the therapy of primary carcinoma of the lung is yet unsettled. This place will be dependent on three fac-

tors: (1) early diagnosis at a time when excision can be carried out before extension or metastasis has occurred, (2) a relatively low operative mortality rate, and (3) a reasonable chance of cure without excessive permanent disability. With regard to the first prerequisite, it is obvious that almost all the responsibility of early diagnosis falls on the shoulders of the general practitioner, who must suspect obscure pulmonary lesions of being due to primary malignant disease and immediately carry out all the diagnostic procedures that are available to him and then, without delay, ask for whatever aid he may need in carrying out the special examinations that are necessary to prove or disprove the presence of this disease. That a great deal of progress has been made, through the alertness of the physician and his cooperation with the roentgenologist and bronchoscopist, is evidenced by the great difference in percentage of correct antemortem diagnoses made in the past five years, as compared with those made at the beginning of the twentieth century. Sehrt⁷ in 1904 reviewed 178 collected cases, proved by autopsy, and found that the correct antemortem diagnosis was made in only 3.3 per cent of the entire group. In a series of cases of obscure chest lesions studied by us in which the symptoms or examinations suggested primary malignancy, this diagnosis was established histologically

TABLE 3.—Duration of Life of Patients Receiving High Voltage Roentgen Therapy and Untreated Patients

Group	Number of Patients	Duration of Life from Onset of Symptoms to Death	Duration of Life from Time of Diagnosis (or Beginning of Irradiation)* to Death
Irradiated.....	13	13.0 months	5.6 months
Not irradiated.....	26	20.1 months	8.0 months

* High voltage roentgen therapy was begun as soon as the diagnosis was established in the cases in which it was used.

in the living subject in approximately 90 per cent. Of the proved cases, 24 per cent were diagnosed at an operable stage and pneumonectomy or lobectomy was carried out. With continued interest in the problem there is no reason why the percentage of clinical discoveries at an operable stage should not steadily increase. It can be shown that progress has been made with regard to the surgeon's ability to resect a human lung safely. Between 1933 and 1936 one of us (Overholt) resected an entire lung for a primary malignant growth or for pulmonary suppuration in twelve cases, with an operative mortality of 33⅓ per cent. Between 1937 and 1939 the operative mortality rate in twelve cases similarly treated was 16⅔ per cent. These figures compare favorably with those pertaining to total resection of abdominal organs for malignant conditions and are certainly not prohibitive when it is realized that a disease is being dealt with that is 100 per cent fatal without surgical treatment. With regard to the third prerequisite, our present knowledge of the ultimate outcome of the patient who has been subjected to pneumonectomy should certainly make us feel hopeful. The first patient treated by Overholt survived pneumonectomy for primary cancer of the lung and is still living and well with no evidence of recurrence five years and four months after operation. The second patient will pass the five year mark in one month, and others have been living without evidence of recurrence for shorter postoperative periods. These

6. Edwards, A. T.: Tumours of the Lung, Brit. J. Surg. 26:166 (July) 1938.

7. Sehrt, quoted by Simons.⁴

patients carry on normal lives, are not unduly limited in their physical activities and show no obvious deformity.

CLINICAL AND PATHOLOGIC CONSIDERATIONS

The great variation of symptoms and clinical manifestations found in primary carcinoma of the lung can be better understood by first considering the pathologic changes that produce them. The general consensus now is that all primary carcinomas of the lung arise from a single undifferentiated parent cell located in the basal layer of the bronchial epithelium, regardless of whether the site of origin is in the main stem bronchi or in the terminal bronchioles.⁴ The degree of differentiation of this parent cell determines whether the tumor will be a squamous cell carcinoma, an adenocarcinoma, an undifferentiated round cell, spindle cell or "oat cell" type, or a combination of two or more of these, which is seen not infrequently. From a clinicopathologic standpoint the symptoms and signs may conveniently be divided into several stages. This division will obviously not be

possible in every case but will probably prove helpful in most instances.

1. Stage Before Bronchial Occlusion.—Soon after the tumor begins to grow, its presence causes irritation of the sensitive bronchial mucosa, which results in a dry, irritative cough. This is by far the earliest, most constant and therefore most important symptom in the majority of cases. Since the cough is ineffectual in removing the irritating agent, an increased amount of bronchial secretion is produced in an attempt to wash out the irritant. This results in the

next frequent early symptom, which is a clear, thin, mucoid sputum. As the tumor enlarges, the trauma from coughing, as well as the tendency for the tumor tissue to undergo degeneration; produces ulceration of its surface, which accounts for the appearance of blood streaked sputum and a tendency for the sputum to become purulent. These are both frequent early symptoms. Physical manifestations and changes demonstrable on the roentgenogram are not present during this stage, because the tumor is not large enough to cast a shadow and the changes incident to bronchial occlusion have not yet appeared. Still it is important to realize that the diagnosis usually can be definitely established by bronchoscopic examination, even at this early period, because the majority of primary carcinomas of the lung arise in the stem bronchi, so that they fall within the range of bronchoscopic accessibility (fig. 1).

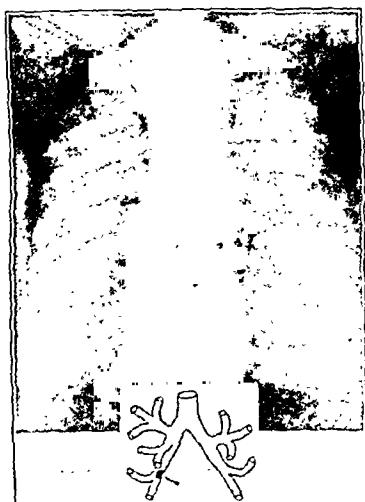


Fig. 1.—Chest of Mr. I. B. Note that the slight alteration in the axis of the ribs, the slight shift of the heart to the right and the minimal amount of increased density adjacent to the right heart border could very easily be overlooked. Because of the persistent cough and discomfort in the chest, even in the absence of definite roentgenologic changes suggesting carcinoma of the lung, a bronchoscopic examination was done. A small tumor in the stem bronchus of the right lower lobe was seen and a biopsy specimen obtained bronchoscopically. Microscopic examination proved it to be a primary epidermoid carcinoma grade 2. Pneumonec-tomy was successfully carried out.

2. Stage of Bronchial Occlusion.—A. Partial Occlusion with Emphysema: Further increase in the size of the tumor causes partial obstruction of the bronchus. In spite of this, air can still be forcibly drawn past the obstructing tumor during the powerful inspiratory phase of respiration. It is impossible for this air to escape completely from the affected segment of lung because

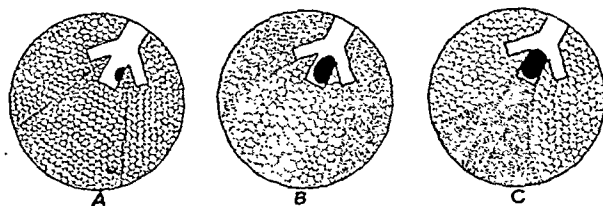


Fig. 2.—Effects of bronchial occlusion due to early carcinoma: A, lung segment normal before occlusion; B, segmental emphysema due to partial occlusion; C, segmental atelectasis due to complete occlusion.

the relatively weak elastic recoil of the lung tissue is not strong enough to force all the inspired air past the point of obstruction before the next inspiration occurs. This results in emphysema of the segment of lung supplied by the affected bronchus and produces the wheezing or asthmatic breathing which is another frequent early symptom. On physical examination during this stage of the disease a hyperresonant percussion note may be found over the involved area. The breath sounds are often emphysematous, with moist expiratory rales and rhonchi. The roentgenogram may show a wedge-shaped area of decreased density with convex limiting borders (fig. 2). Partial occlusion of a bronchus is responsible for the erroneous diagnosis of asthma which is not infrequently made. In the great majority of cases this phase of the disease is apt to be of short duration, owing to the relatively small size of the bronchial lumen and the rapidity with which even a small growth will produce complete occlusion.



Fig. 3.—Chest of Mrs. E. H., showing a diffuse homogeneous shadow in the postero-anterior exposure produced by atelectasis of the lingular segment of the left upper lobe. The lateral exposure localizes the atelectatic segment to the anterior-inferior portion of the upper lobe. Note the absence of marked mediastinal shift, elevation of the diaphragm and narrowing of the intercostal spaces due to the ability of the lower lobe and uninvolved portions of the upper lobe to compensate for the shrinkage of the lingular segment. Bronchoscopic biopsy proved the tumor to be a carcinoma simplex. This patient is well, with no evidence of recurrence, four years eleven months after pneumonec-tomy.

B. Complete Occlusion with Atelectasis: The complete occlusion of the bronchus to a segment of lung or a lobe produces still a different picture. Atelectasis occurs and the airless segment becomes shrunk and functionless. Dyspnea, which is another frequent early

symptom, appears not alone because of the decrease in lung volume, but also probably because of the mediastinal shift, which displaces the trachea and interferes with heart action. The discomfort or feeling of weight and constriction in the chest so often noted during this period is probably due to a reflex spasm of the intercostal muscles and the smooth muscle in the walls of the bronchial tree. Pain of any severity is not a part of the picture of early carcinoma of the lung and, when present, is usually due to pleurisy resulting from a complicating inflammatory process. The absence of pain should not be considered evidence against the presence of primary carcinoma of the lung. The severe pain usually described as being an outstanding symptom of this disease occurs in the later stages as a result of extension or metastasis of the tumor to the pleura, bones, nerve structures or other organs.

Atelectasis is by far the most frequent pathologic change giving rise to physical manifestations at an early stage. The manifestations incident to uncomplicated atelectasis are diminished to absent tactile fremitus, dullness to flatness on percussion and diminished breath sounds, which, if audible at all, are of bronchovesicular or bronchial quality. Associated with these changes will be a varying degree of mediastinal shift toward the affected side, with diaphragmatic elevation and narrowing of the intercostal spaces. The roentgenologic

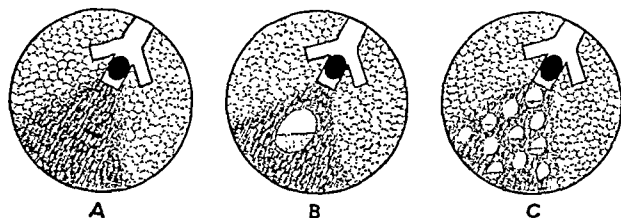


Fig. 4.—Effects of bronchial occlusion plus infection: A, segmental atelectasis with diffuse pneumonitis; B, segmental atelectasis with large abscess showing fluid level; C, segmental atelectasis with pneumonitis and multiple cavities.

appearance is again due, in most cases, to atelectasis, which characteristically produces a dense, wedge-shaped shadow with concave borders extending from the hilus out to the chest wall (fig. 2). It must be remembered that, if the atelectatic segment extends from the hilus posteriorly or anteriorly, the shadow may not appear to reach the periphery of the lung in the anteroposterior film; but if lateral and oblique exposures are taken it may clearly be shown to do so (fig. 3). These additional films are important in a study of patients suspected of having bronchial occlusion. An excellent treatise on the roentgenologic aspects of bronchostenosis, which is well worth studying, has recently been prepared by Westermarck.⁸ Again, a varying degree of mediastinal shift, diaphragmatic elevation and narrowing of intercostal spaces will be associated, depending on the size of the segment of the atelectatic lung. It is notable that the tumor per se casts a shadow on the roentgenogram in only a small percentage of cases at an early stage. This is more apt to occur in peripherally located lesions.

C. Bronchial Occlusion with Secondary Infection: With bronchial occlusion and ulceration, secondary infection of the bronchial tree usually occurs because the ability of the ciliated epithelial cells to sweep out contaminating bacteria is impaired. This may progress into bronchitis, bronchiectasis, varying degrees of pneu-

monitis, abscess or even gangrene of an entire lung. The type of infection that develops depends mainly on the size of the affected bronchus and the virulence and type of infecting organisms present. In the cases of carcinoma collected by Simons,⁴ approximately one third of the entire group presented evidence of pulmonary infection. One must therefore be aware of the frequent occurrence of secondary infection and not be found guilty of treating a patient for "unresolved pneumonia," "bronchitis" or "pleurisy" while he is dying of primary carcinoma.

The symptoms and signs that appear during this phase of the disease obviously will vary considerably, depending on the nature and severity of the complicating inflammatory lesions and the prominence of the symptoms and signs due to the uncomplicated bronchial occlusion. With the development of diffuse bronchitis or bronchiectasis, cough productive of a varying amount of more or less purulent sputum will be present. If the tumor now causes complete obstruction to drainage from the bronchial tree the patient will soon become acutely ill, owing to the pulmonary infection, and may present the clinical picture of pneumonia. Drainage may suddenly be reestablished owing to breakdown of the obstructing tumor or decrease in the surrounding edema, so that the patient may expectorate a large amount of sputum, after which he will feel much better until the bronchus again becomes occluded. The acute pneumonic symptoms will then reappear. Such a sequence of events is relatively common and is responsible for the diagnosis of "recurrent pneumonia" which is made at times. If there is considerable destruction of the lung due to infection or breakdown of the tumor, cavitation will result. Thus lung abscess may be closely simulated, since in reality abscess in this phase of the disease would be the outstanding pathologic process present (fig. 4). With the development of other inflammatory lesions, other symptom complexes will be found.

As might be expected, the observations made on physical examination during this phase of the disease are also extremely variable and are not characteristic of carcinoma of the lung, since there are so many factors involved in their production. If the suppurative complications predominate, the usual signs of bronchitis or bronchiectasis or of the consolidation resulting from pneumonitis will be present. If cavitation occurs following excavation of an abscess, changes due to this lesion will be present. Now when one sees a case in which manifestations resulting from the inflammatory lesions are intermingled with those resulting from the primary partial or complete bronchial occlusion it becomes apparent that there may be an endless number of different physical conditions found.

The roentgenologic appearances present during this stage are those of the uncomplicated bronchial occlusion already described plus the changes incident to the various inflammatory processes that may be present. The homogeneous appearance of the atelectatic shadow is frequently mottled by the infectious process, and at times multiple small areas of cavitation appear. Also the margins of this shadow are often hazy and indefinite, owing to adjacent pneumonitis (figs. 4 and 5).

3. Stage of Extension or Metastases.—There are many other symptoms, physical signs and roentgenologic changes that are due to extension of the tumor or metastases, such as dysphagia, abnormal symptoms of the central nervous system, phrenic nerve paralysis, dilated veins of the neck, chest wall or upper extrem-

8. Westermarck, Nils: On Bronchostenosis: A Roentgenological Study, *Acta radiol.* 19: 285, 1938.

ities, and diffuse carcinomatous infiltration of the lung; but these are all signs of the disease at a time when the possibility of cure has passed and are therefore relatively unimportant clinically, so they will not be considered further.

In considering the effects of bronchial occlusion in the various stages mentioned, it is important to realize that the severity of symptoms and the prominence of physical and roentgenologic changes will be directly proportional to the size of the affected bronchus. Thus, if a main stem bronchus is occluded, the symptoms will be severe and the appearances unquestionable. However, if a small peripheral bronchus is affected the symptoms will be insignificant, the physical manifestations will be localized to a small area so that they will almost surely be overlooked, and the roentgenologic changes will be minimal. It is important also to be aware of the fact that the shadow cast on the roentgenogram incident to bronchial occlusion may not correspond exactly to the gross anatomic distribution of one of the five pulmonary lobes because, in the first place, only one branch of one of the lobar bronchi may be affected, and, in the second place, the shadow will be distorted, in the case of emphysema by distention and enlargement and in the case of atelectasis by collapse and shrinkage.

It should be emphasized that symptoms and signs of one or all of the aforementioned stages may be present at one time. This is possible because, for example, a tumor arising in the main middle lobe bronchus may produce complete obstruction, with atelectasis of the entire middle lobe, while the extrabronchial portion of the same tumor may produce partial occlusion of the bronchus of the lower lobe resulting in emphysema of the lower lobe. Thus two stages may be represented at one time. Now, if infection develops in either the atelectatic or the emphysematous segment, symptoms and signs of a third stage may appear. If the tumor metastasizes, manifestations of the terminal stage may also be present.

ANALYSIS OF AUTHORS' SERIES OF CASES

This analysis is based on the study of seventy-five cases in which the diagnosis of primary carcinoma of the lung has been proved histologically. The only significant predisposing etiologic factors found were age and sex. The average age of these patients was 50 years; the youngest was 18, and the oldest 68. Fifty-four of the patients were men and only twenty-one were women, a ratio of 2.6 to 1.

For the purpose of study these patients were arbitrarily separated into two groups, one in which the tumors were located in a stem bronchus and the other in which the lesions were located peripherally. In the stem bronchus group there were fifty-seven cases (76 per cent) and in the peripheral group eighteen cases (24 per cent). The main practical difference between the two groups is that the lesions in the stem bronchus group fall within the range of the bronchoscope, which facilitates preoperative diagnosis, while the tumors located peripherally are not accessible to bronchoscopic examination. Therefore, in most of these cases exploratory thoracotomy must be done to establish the diagnosis definitely. Some of these tumors may possibly be removed by lobectomy rather than by pneumonectomy, owing to their distant location from the hilus.

SYMPTOMS

The symptoms found in this series of cases and the relative frequency of occurrence in the two groups is

shown in table 4.⁹ Cough was by far the most common and earliest symptom, being present in 87 per cent of the entire group. At the onset in most cases it was dry and irritative. It soon became productive of a clear, odorless, mucoid sputum which, as the disease progressed, changed to a more purulent character, depending on the amount of infection and ulceration that developed. Fever was present in 53 per cent of the cases and was definitely more frequent in the stem bronchus group. This again brings up the importance of recognizing the frequent occurrence of secondary inflammatory changes, which often dominate the clinical picture and mask the presence of the primary lesion until the operable stage of the disease has passed. Chest pain or discomfort, in the form of a dull ache or heavy sense of constriction, was present in 44 per cent. Pain of any great severity was not found early in the great majority of cases and, when present, could be accounted for by inflammatory processes. Hemoptysis was present in 38 per cent of the total group and was more common in the peripheral lesions. This was, at an early stage, streaking of the sputum with bright red blood and, less frequently, raising of old blood of a brownish red color.

TABLE 4.—Occurrence of Symptoms in Authors' Cases

Symptoms	Stem Bronchus Group (52 Cases)		Peripheral Group (16 Cases)		Entire Group (68 Cases)	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
Cough.....	46	88.4	13	81.2	59	86.7
Fever.....	29	61.5	7	43.7	36	52.0
Pain or discomfort.....	21	40.3	9	56.2	30	44.1
Hemoptysis.....	18	34.6	8	50.0	26	38.2
Weight loss.....	18	34.6	8	50.0	26	38.2
Dyspnea.....	16	30.7	5	31.2	21	30.8
Weakness.....	10	19.2	1	6.2	11	16.1
Chills.....	6	11.5	0	0.0	6	11.7
	5	9.6	1	6.2	6	8.8
	5	9.6	0	0.0	5	7.3

Note: Sputum not represented but was present in majority of cases in which there was cough.

Massive hemorrhage occurred only in advanced cases. Dyspnea or wheezing was present in 38 per cent of the cases and was frequently an early symptom. The other symptoms mentioned in table 4 were present in the more advanced cases. No group or complex of symptoms was found which could be called characteristic of the disease.

PHYSICAL SIGNS

Physical manifestations were present in 93 per cent of all cases but were so variable that little reliance was placed on them. They usually simulated the pathologic changes produced by the conditions from which carcinoma of the lung must be differentiated.

ROENTGENOLOGIC ASPECTS

Definite changes were present on the roentgenogram in 96 per cent of the cases. The most frequent finding was the shadow cast by the tissue of the atelectatic lung, in lobar or lobular distribution, with the accompanying changes in the mediastinum and thoracic cage previously mentioned (fig. 3). These changes were present in 85.3 per cent of all cases. In a small number of cases, changes resulting from segmental emphysema were associated. Evidences of a

9. The figures regarding the occurrence of symptoms are taken from a study of sixty-eight cases recently reported (Overholt, R. H., and Rumel, W. R.: Clinical Studies of Primary Carcinoma of the Lung, Journal-Lancet 58:155 [April] 1939).

superimposed inflammatory process were also frequently present (fig. 5). A shadow of the tumor itself was cast in only 17 per cent of the cases, and the majority of these were in the peripheral group. Here the shadow produced was in the form of a rounded area of increased density with a margin, which in some cases, was quite smooth and well demarcated from the



Fig. 5.—Chest of Mr. J. F., showing the shadow produced by atelectasis of the left upper lobe with additional changes incident to secondary infection. The mottling due to diffuse pneumonitis and multiple abscess formation is best shown on the overexposed film. Bronchoscopy with biopsy proved the primary lesion to be an undifferentiated carcinoma originating in the bronchus of the left upper lobe. The lesion was found to be inoperable at the time of bronchoscopic examination.

surrounding lung tissue (fig. 6), while in others it was softer, infiltrative and more irregular. The dense, homogeneous, wedge-shaped shadow with concave margins typical of atelectasis, often associated with a shift of the mediastinum, was found to be quite characteristic. However, this appearance does not invariably indicate the presence of primary carcinoma of the lung, since any lesion which obstructs a bronchus can produce such a shadow.

DIAGNOSTIC PROCEDURES

I. Bronchoscopy.—Bronchoscopic examination is by far the most valuable single diagnostic procedure in studying patients suspected of having primary cancer of the lung, for the following reasons:

1. Approximately three fourths of all primary lung tumors are situated in the major bronchi, so that they are within the range of bronchoscopic vision. In our group of fifty-five stem bronchus lesions in which bronchoscopy was done a biopsy of tumor tissue was obtained in fifty-three instances, thus furnishing microscopic proof of the diagnosis.

2. Bronchoscopy is the only safe and practical means of obtaining a biopsy in the stem bronchus group. This cannot be said for transthoracic aspirational biopsy.

3. In the great majority of cases the diagnosis can be made much earlier than by any other method.

We feel, therefore, that there is no real justification for postponing bronchoscopic examination of a patient in whom a dry or productive cough develops, alone or associated with hemoptysis, wheezing, dyspnea, chest discomfort or other symptoms suggestive of early primary carcinoma of the lung that cannot be definitely explained on some other basis. We feel that this is true even in the absence of physical manifestations and roentgenologic changes, especially if the patient is of "cancer age" and has previously been symptom free. We can see no logical reason why one should await the development of additional symptoms, physical signs or abnormalities on the roentgenogram when these

changes, even at an advanced stage of the disease, furnish merely presumptive evidence of the presence of primary carcinoma of the lung.

Aside from being the most important diagnostic procedure available, bronchoscopy is also valuable in determining the operability of a given tumor and at times it is helpful as a therapeutic measure. If a tumor is seen on bronchoscopic examination to extend into the wall of the trachea, it may have to be considered inoperable from a technical standpoint. If the trachea and mediastinal structures are firm and fixed, or if the angle of the carina is widened or distorted, it is very probable that these changes are due to the growth of metastatic tumor tissue in the mediastinal glands around the bifurcation of the trachea, thus making the case inoperable.

A patient may become gravely ill as a result of pulmonary suppuration distal to an obstructing tumor, which prevents adequate drainage of pus from the bronchial tree. In such cases bronchoscopic dilation may temporarily relieve the obstruction and improve the patient's general condition, enabling him to withstand excision of the tumor, which he would otherwise be unable to tolerate. It is important to know that a patient may be seriously ill because of secondary suppurative processes in the lung and still have a cancer that has not become inoperable. Such a patient certainly deserves a bronchoscopic examination, followed by whatever endobronchial or surgical treatment is deemed advisable by the thoracic surgeon.

Since bronchoscopic examination is such an important part of the routine study of the patient presenting symptoms or signs which may be due to primary carcinoma of the lung, it is hoped that this procedure will not be used as a last resort in making a diagnosis after all other methods have failed and much valuable time has been wasted. The importance of delay can be better



Fig. 6.—Chest of Mr. R. B., showing a round, well circumscribed peripheral shadow in the right lower lobe cast by a bronchiogenic adenocarcinoma. No evidence of extension of the tumor was found at the time of exploratory thoracotomy, so lobectomy was performed. The patient survived the operation and is at present perfectly well, with no evidence of recurrence, sixteen months after the operation.

understood if it is realized that a disease is being dealt with in which the time from appearance of symptoms until death is short, as is shown in the following groups of cases: Jaffé² approximately five months, Frissell and Knox¹⁰ approximately seven and one half months and Koletsky¹ approximately nine months. It becomes obvious that if one expects to save the patient who is suffering from a disease which runs such a rapid course one must act quickly in arriving at the correct diagnosis before the stage of operability has passed.

The following thought expressed by Rienhoff,¹¹ seems especially applicable to the subject under consideration.

10. Frissell, L. F., and Knox, Leila Charlton: Primary Carcinoma of the Lung, *Am. J. Cancer* 30: 219 (June) 1937.
11. Rienhoff, W. F., Jr.: Carcinoma of the Lung, *Surgery* 1: 125 (Jan.) 1937.

He says: "Our clinical pace must be quickened, for until recently the great majority of recognized affections of the respiratory tract have been those in which Time was felt to be the Great Healer, but with the development of methods by which patients can not only be relieved but cured of malignant neoplasms of the lung, it may be said that Time now takes on the role of executioner."



Fig. 7.—Artist's reproduction of the left lung of Mr. J. S., which was surgically removed. To facilitate illustration, the specimen was sectioned through the stem bronchi to expose the tumor. From its point of origin in the bronchus of the left upper lobe the tumor had extended peripherally through the parenchyma of the lung to produce a sunken, puckered appearance of the opposite visceral pleura (inset). Microscopic examination proved the tumor to be an epidermoid carcinoma grade 3. Unfortunately this patient died after the operation.

II. Bronchography after the injection of iodized oil may aid in the diagnosis of tumors which are out of the range of bronchoscopic vision, but we feel that this procedure should be used only if the results of bronchoscopy are negative. Reliance cannot be placed on a negative bronchographic examination alone, and if it is positive bronchoscopy must still be carried out to complete the study of the case by visualizing the tumor and obtaining a biopsy specimen for microscopic examination.

III. The demonstration of malignant tissue in the sputum, as reported by Dudgeon and Wrigley¹² and later by Barrett,¹³ has in a limited series of our cases proved disappointing.

IV. Aspirational biopsy is a dangerous procedure, since pleural infection may follow withdrawal of a needle from an infected lung through the pleural space, and we feel that it has no clinical value except to establish the diagnosis in cases which are obviously

inoperable. This statement is believed to be true because, if the biopsy is positive in a suspected case without clinical evidence of metastasis, exploratory thoracotomy is indicated, and if the biopsy is negative in the same type of case the same exploration is still the next step in its management.

V. Exploratory thoracotomy was carried out in thirty-eight (50.6 per cent) of the seventy-five cases in this series. None of these patients had demonstrable evidence of metastasis before exploration. We believe that this procedure is indicated in any case in which the diagnosis of primary carcinoma of the lung has been established or is suspected, because of the presence of suggestive symptoms, physical manifestations or roentgenologic changes, just as an exploratory laparotomy is indicated in a suggestive lesion in the stomach or bowel, where the presence of a malignant growth cannot be excluded. Fortunately in the majority of instances the diagnosis can be proved preoperatively by bronchoscopic examination. In most cases in which this is not possible the tumors are located peripherally, so that the diagnosis can be definitely established at the time of exploration. Before thoracotomy is done, one should be sure that there is no clinical evidence of metastasis. Careful neurologic examination should be done to rule out involvement of the central nervous system. Biopsy of enlarged cervical glands should be done if they are found. Skeletal roentgenograms should be taken to rule out metastases to the bones. Fluoroscopic examination should be carried out to exclude the presence of diaphragmatic paralysis, since this is almost a sure sign of extension of the disease. Mediastinal infiltration should be ruled out by bronchoscopic examination.

OPERABILITY

In the group of seventy-five cases lung resection was carried out in twenty-one—pneumonectomy in seventeen and lobectomy in four (fig. 7). Fulguration was possible in only one instance. Two cases in which

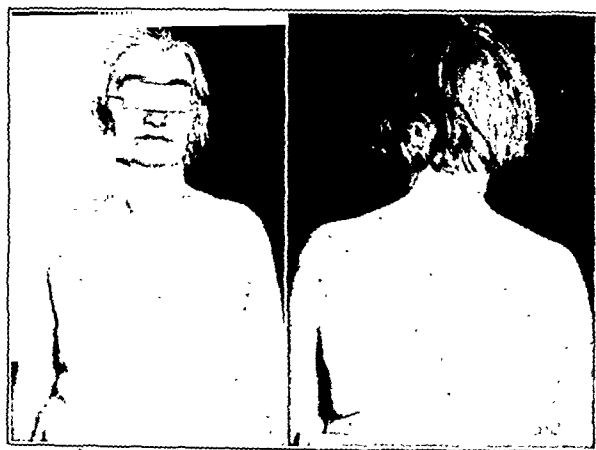


Fig. 8.—Mrs. T. K. as she appeared two years and four months after pneumonectomy for a primary small cell carcinoma of the left upper lobe. She feels perfectly well and has done all her work as a housewife for the past two years. Note the absence of significant deformity and the satisfactory state of nutrition of this patient.

resection was done were apparently operable at the beginning of the operation, but before the excision was completed evidence of mediastinal metastasis was found. In two other cases extension of the tumor into the chest wall had occurred. These were treated by removal of a block of chest wall with the affected lung. In the final analysis there were eighteen cases (24 per

12. Dudgeon, L. S., and Wrigley, C. H.: On the Demonstration of Particles of Malignant Growth in the Sputum by Means of the Wet-Film Method, *J. Laryng. & Otol.* 50: 752 (Oct.) 1935.

13. Barrett, N. R.: Examination of the Sputum for Malignant Cells and Particles of Malignant Tissue, *J. Thoracic Surg.* 8: 169 (Dec.) 1938.

cent of the entire group) in which no evidence of metastasis or extension of the tumor was found at the time of the operation.

RESULTS OF SURGICAL TREATMENT

Of the four patients treated by lobectomy, three recovered from the operation and were discharged as improved. One patient had direct extension of the tumor into the chest wall and another had metastases to the mediastinal glands which were resected. Both of these patients have since died. The third patient died after the operation, and the fourth is living and well sixteen months after the operation.

In the group of seventeen for whom pneumonectomy was done, six patients died within two months of the operation; these deaths are considered operative deaths. Three patients died after making an operative recovery. It is significant to note that only one of these succumbed as a result of definite recurrence of malignant disease. This death occurred six months after the operation. The second patient died a year after the operation as a result of a psychosis. Complete postmortem examination of this patient revealed no evidence of a malignant growth. The third late death occurred two years after operation, from an unknown cause. Unfortunately an autopsy permit was not obtained. However, three and one half months before death the patient had no demonstrable evidence of a recurrent malignant growth on clinical and roentgenologic examination.

Eight patients treated for primary lung cancer by pneumonectomy are living and well with no evidence of recurrence of the malignant condition. They are all able to carry on the same activities in which they were engaged before the operation. Not one has significant cardiorespiratory embarrassment and, when clothed, not one has obvious deformity (fig. 8). The longest periods of survival postoperatively are five years four months, four years eleven and one-half months and two years ten and one-half months.¹⁴

CONCLUSIONS

1. Primary carcinoma of the lung is a relatively common disease which is responsible for approximately 10 per cent of all cancer deaths.

2. In this clinical study seventy-five patients had histologically proved primary carcinoma of the lung.

3. Partial or complete bronchial occlusion, with or without secondary infection, produces the most important pathologic lesions giving rise to early symptoms, physical manifestations and roentgenologic changes.

4. Bronchoscopic examination is by far the most important diagnostic procedure available and should be used without delay in the study of any case in which a dry or productive cough develops alone or in association with hemoptysis, wheezing, dyspnea, chest discomfort or other symptoms suggestive of early primary carcinoma of the lung that cannot be definitely explained on some other basis.

5. The diagnosis was established with histologic verification at an operable stage in 24 per cent of the seventy-five cases.

6. Lobectomy and pneumonectomy are practical therapeutic procedures, without an excessive operative mortality rate, which at the present time appear to offer a good chance of survival to the patient suffering from primary carcinoma of the lung.

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14. At the time the authors' proof was submitted, Feb. 3, 1940, all of the patients were still alive and well without evidence of metastatic disease. The longest survival periods were then six years three months, five years ten months and three years ten months.

PREVENTIVE PEDIATRICS

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Whether or not the cost is borne by taxation, private fees or local charity,¹ prevention is the most important phase of pediatrics and should be extended both by general practitioners and by pediatricians. "He who cures a disease may be the most skilful, but he who prevents it is the safest physician." Three fourths of the quarter of a million annual deaths of American children² can and should be prevented. Twenty-one per cent of these deaths are due to curable diseases, while 56 per cent are caused by preventable conditions (table 1). The public should be educated to utilize the facilities available at present.¹

During the last thirty-three years much has been accomplished, and the infant mortality rate in New York City, for example, has fallen from 140 per thousand living births to 55. This decrease has been mainly in the diarrheal deaths and probably is due to a better milk supply and more intelligent infant feeding. The mortality rate of tuberculosis and the respiratory and infectious diseases also has been reduced, though to a lesser extent. Unfortunately, the diseases peculiar to early infancy kill nearly as many now as in 1898. In spite of a general belief to the contrary and although still more must be done, the reduction in infant mortality in the United States can be compared favorably with that of many other civilized countries. For instance, in 1900, 190 of every thousand German infants and 290 per thousand of those in Breslau died during their first year, while in 1933 only 80 per thousand succumbed.³ In this country, in 1915 the infant mortality under the age of 1 year was 100, but in 1936 it was 57.⁴ During this period, the reduction in the deaths among infants in the second to the twelfth month of life was 56 per cent but in those in the first month of life only 27 per cent. The variation in infant mortality, however, in the several states leaves much to be desired, ranging from a maximum of 136 in one state to a low point of 39 in the state of Washington.

ANTEPARTUM, INTRAPARTUM AND POSTPARTUM CARE

The problem of prevention can be simplified by dividing it into its two constituent parts, antepartum (including intrapartum and neonatal measures) and postpartum care. The need for better antepartum, intrapartum and neonatal care is emphasized by the fact that over half of the deaths in this country under the age of 1 year (thirty-four of fifty-seven) occur under the age of 1 month (table 2).⁴ Improved antepartum care and the antepartum hospitalization of mothers who need it can and must be supplied through the cooperation of general practitioners, obstetricians, pediatricians, health officials, nurses and hospitals. That such joint effort is efficacious has been demonstrated

From the Department of Pediatrics, Duke University School of Medicine, and Duke Hospital, with the cooperation of Drs. J. A. Hayne, W. F. Draper, J. M. Fierott, Oren Moore, Hayard Carter, L. T. Royster and William Weston (Report of a Committee on Infant Mortality in North and South Carolina, and Virginia) and of Miss Judith Farrar, Librarian of Duke Hospital.

1. Davison, W. C.: The Future of American Pediatrics, *J. Pediatr.* 14: 810 (June) 1939.

2. Mortality Statistics, 1927-1933, Part 1, Tables and General Tables. United States Department of Commerce, Bureau of the Census.

3. Stolte, Karl, cited in Berlin Letter, *J. A. M. A.* 101: 239 (Jan. 19) 1935; Statistisches Jahrbuch Deutsche Reich, 1934.

4. Summary of Live Birth, Infant Mortality and Stillbirth Statistics in the United States, 1933, Department of Commerce, Bureau of the Census; United States Department of Labor, Children's Bureau, Sept. 14, 1935 (5036). Personal communication from Dr. Martha M. Elliot and Dr. T. F. Murphy.

by Gengenbach and his associates in Denver, who reduced the number of infant deaths from 178 per thousand live births to 15 per thousand by antepartum measures.⁵ If further proof is required of the need for more and better antepartum care it is supplied by the increase in infant deaths in Durham County, N. C., from 1932 to 1935.⁶ As this increase was only among white infants under 1 month of age, it seems logical to assume that many of the white mothers who prior to 1930 could afford antepartum care are not seeking it now, as a result of the depression. Charity antepartum and obstetric clinics are available, but many mothers still regard antepartum care as an unessential luxury. Should not greater efforts be made to persuade expectant mothers not only of the advisability but of the necessity of visiting their physicians or these antepartum clinics at frequent intervals? The antepartum, intrapartum and neonatal measures necessary for the reduction of infant mortality are simple and within the reach of many expectant mothers and of every competent physician.⁷ Ignorance of the necessity for antepartum care probably is as important a factor in infant mortality as are poverty and the lack of facilities. One of the main difficulties is in establishing contact between the mother and the physician. The child health program sponsored by the United States Children's Bureau, state and county boards of health and the American Academy of Pediatrics¹ emphasizes this aspect of the problem, through publicity methods urging expectant mothers to go frequently to their physicians as well as through the establishment of antepartum clinics at which obstetric and also contraceptive advice can be obtained.

In order to insure the greatest health to an infant, the prevention of disease should commence as soon as the mother knows that she is pregnant, as her health as well as that of her unborn infant is greatly affected during this period. The changes in organs are sudden. There is a double load on the heart and kidneys. Metabolism is speeded up, and the importance of diet and its effect on both mother and child cannot be over-emphasized. Children would be born with a much

die during gestation or in early infancy. These deaths can be prevented by the adequate insulin therapy of the mother, especially during delivery, and by the intramuscular injection of 10 cc. of 5 per cent dextrose in saline solution into infants to prevent the hypoglycemia which usually occurs during the first few hours of life.¹⁰ The infants of diabetic mothers are larger than the average, and the pregnancy sometimes should be interrupted after the eighth month or whenever the fetus weighs more than 3 Kg. (6½ pounds). No patient requires more frequent and detailed checking than does the expectant mother.

Prematurity.—Sixty per cent of infant deaths occur in the first month of life, and nearly half of them are

TABLE 2.—Causes of Pediatric Deaths* Which Can Be Reduced by Better Antepartum, Intrapartum and Neonatal Care

Prematurity
Birth injuries
Stillbirths
Conditions of early infancy (atelectasis, asphyxia, suffocation)
Impetigo
Syphilis

* Representing 60 per cent of deaths under the age of 1 year and 26 per cent of the total pediatric deaths.

due to prematurity. Seventy per cent of the deaths of these premature babies take place in the first twenty-four hours; this is more than double the percentage of deaths of full term infants during the first day. The improper use of drugs, analgesics and anesthesia, toxemia of pregnancy, pneumonia and syphilis are responsible for many of the premature deaths. The administration of morphine to the mother within four hours before delivery greatly increases the mortality among premature infants. The most common causes of death associated with prematurity are chilling, injury during resuscitation, malformation and pneumonia. The longer the delivery of a premature infant can be delayed, the greater is the weight of the fetus and the lower the infant mortality, although if the mother has toxemia the risk of a stillborn infant is increased.

Birth Injury.—This factor is the next most common cause of death during the first ten days of life. To reduce its frequency, every pregnant woman should have the diagonal conjugate diameter of her pelvis (from the under surface of the symphysis pubis to the promontory of the sacrum, normally 11.5 to 12.5 cm., or 4½ to 5 inches) measured with a sterile gloved hand in the vagina; if the distance is less than 9.5 cm. (4 inches) she should be delivered in a hospital. Other pelvic measurements are useful, but that of the diagonal conjugate diameter is essential. Most of the maternal and infant deaths due to delivery would be prevented if all births were supervised with sterile surgical technic (not hurried) by competent family physicians, by obstetricians or by trained nurses who have had special obstetric training (not that of the usual midwife). The use of oxytocic preparations and of interfering procedures to initiate labor or to speed delivery greatly increases infant and maternal mortality. A bulletin⁷ on this subject can be obtained from the United States Children's Bureau, Washington, D. C.

Stillbirths and Other Deaths of Early Infancy.—Mortality can be reduced if every pregnant woman has her blood pressure determined and her urine, heart and

TABLE 1.—The Causes of the 240,000 Annual Deaths Among American Children

Type of Condition	Number of Conditions	Percentage of Deaths Caused*
Preventable.....	37	56
Curable.....	63	21
Remainder.....	207	23

* Percentage of total pediatric mortality in the United States.

better nutritional foundation if those who look after pregnant women would more carefully apply the available information concerning diet during pregnancy rather than, as is so often the case now, merely saying "Just eat a good general diet," if they mention diet at all.⁸ Diet during the last two months of pregnancy is particularly important.⁹ Disease of the mother, such as toxemia, nephritis, diabetes, heart disease, tuberculosis or syphilis, also is an important cause of neonatal mortality. Fifty per cent of the infants of diabetic mothers

5. Gengenbach, F. P.: Infant and Maternal Mortality in Denver, J. Pediat. 1: 719-726 (Dec.) 1932, 3: 718-729 (Nov.) 1933.
6. Kerner, J. W.: A Shift in the Infant Mortality Rate in Durham County, North Carolina, J. Pediat. 10: 236-242 (Feb.) 1937.
7. Standards of Prenatal Care, United States Department of Labor, Children's Bureau Publication 153, 1934.
8. Casparis, Horton: Preventive Pediatrics, South. M. J. 30: 746-750 (July) 1937.
9. Perry, G. G.: An Attempt to Control the Size of the Baby, South. Med. & Surg. 100: 377-379 (Aug.) 1938.
10. Hartmann, A. F., and Jaudon, J. C.: Hypoglycemia, J. Pediat. 11: 1-36 (July) 1937.

lungs examined every month during gestation. If the blood pressure is elevated, if the urine contains albumin or sugar or if the woman has vomiting, convulsions, vaginal bleeding, anemia, infections or any cardiac, thyroid, pulmonary or toxic symptoms, she should obtain competent medical or obstetric advice and treatment. The oftener a pregnant woman visits her physician, the greater is the probability of her having a normal living infant.¹¹ The mother also should visit her dentist two or three times during pregnancy so that her teeth may be kept in good condition.

Atelectasis, Asphyxia and Suffocation.—These conditions often can be eliminated if the mother is not given sedatives during delivery and if the newborn infant, after the air passages are cleared by gentle wiping or suction with a catheter, is given inhalations of 5 per cent carbon dioxide in oxygen for five minutes every four hours for the first day of life. A tracheal catheter may be necessary. Gentle mouth to mouth insufflation is recommended for resuscitation. Patting the soles of the infant's feet before each feeding to insure lusty crying also is useful for atelectasis.

Gonorrheal Ophthalmia.—This disease can be prevented entirely if two drops of a fresh 1 per cent solution of silver nitrate are carefully placed in each eye

TABLE 3.—Causes of Pediatric Deaths* Which Can Be Prevented by Postnatal Measures

Accidents	Measles
Anemia	Mumps
Brucellosis	Nutritional disturbances
Chickenpox	Pertussis
Dehydration	Poisoning
Dietary deficiencies (pellagra, rickets, scurvy, tetany)	Rabies
Diphtheria	Scarlet fever
Dysentery	Smallpox
Malaria	Tetanus
Malnutrition	Tuberculosis
	Typhoid-paratyphoid fever

* Representing 30 per cent of the total pediatric deaths.

of the infant (Credé method) immediately after birth (not on the cheeks or closed eyelids, as occasionally happens). In addition to these initial drops of silver nitrate, the instillation of 20 per cent mild protein silver in each eye once daily for the first three days of life is recommended.¹²

Impetigo Neonatorum.—This disorder is rare if, after the excess blood is wiped off at birth, the skin, except that of the buttocks, is not cleaned again for nine days, i. e. if the vernix caseosa is left intact. The use of various antiseptic oils and the application of 1 per cent copper oleate or 2 per cent ammoniated mercury also are efficacious.¹³

Syphilis of the Newborn.—Syphilis neonatorum can be eliminated if every pregnant woman has a Wassermann, Kahn or Laughlen test as early as possible in pregnancy. If it is negative and the symptoms or the history suggests syphilis, the test should be repeated. If the Wassermann test is positive, it also should be repeated as false positive as well as false negative reactions occur. Antisyphilitic treatment should be started as soon as a diagnosis of syphilis is made by a Wassermann test or the history, preferably before the fourth month of gestation; it should be continued

throughout pregnancy and not stopped until serologic tests are persistently negative. A Wassermann, Kahn or Laughlen test¹⁴ also should be made for every child who is examined for the first time, but treatment should not be started until the serologic evidence is conclusive or spirochetes are found by dark field examination. For every case of syphilis diagnosed clinically, at least five are discovered by routine serologic tests. Roentgenograms of the bones usually are diagnostic by the age of 2 months but should be confirmed by repeated Wassermann tests. Knowing the Wassermann reactions of the patient's parents is helpful but not diagnostic, as 20 per cent of syphilitic women are seronegative and 25 per cent of the children of syphilitic mothers are normal. If the child has syphilis, antisyphilitic treatment should be continued for at least seventy-five weeks.

POSTPARTUM MEASURES

The medical profession knows of the specific measures needed to prevent the conditions listed in table 3 but, as with antepartum care, the problem is to persuade parents to bring their children to the physician. Every physician who cares for children should practice, as a minimum, the procedures to be listed. An example of the accomplishments of postpartum preventive measures was reported by Brooks,¹⁵ who stated that in Durham, N. C., the mortality of white infants fell from 83 to 57 per thousand births and that of Negro infants from 196 to 119 during the first four years of the operation of well baby clinics.

Periodic Examinations.—Infant mortality also can be reduced if every infant is carefully and completely examined by a family physician or pediatrician immediately after birth and at intervals of one month during the first half of the first year, of two months during the second half, of four months during the second year, of six months from the third to the sixth year and annually between the ages of 6 years and puberty. After the age of 2 years every child should be seen at least twice a year by a dentist. Annually from the age of 6 years, or earlier if necessary, children's vision should be tested by having them read test figures at a distance of 20 feet; children with visual defects should be examined and treated by a competent ophthalmologist. Deafness should be investigated by an otolaryngologist. The summer round-ups of children advocated by parent-teacher associations and health departments have been very beneficial.¹⁶ Summer camps and Boy and Girl Scout activities also have greatly improved the health of children. It is just as true of children as it is of automobiles that checking at intervals and precautionary measures are more economical and more satisfactory than waiting until trouble requires repairs. If

14. A positive Wassermann reaction of the cord blood or of the infant's blood during the first week of life and even up to the seventy-third day is evidence of syphilis in the mother but not necessarily in the infant (Fildes' law). The Wassermann reaction of the cord blood usually is the same as that of the infant's blood, but only half of the mothers who have positive blood Wassermann reactions have positive cord reactions. Of the children whose cord or early blood Wassermann reactions are positive, 17 per cent do not have syphilis, and the reaction becomes negative weeks usually is less strongly positive, and the reaction becomes negative at the age of 3 months. If the child has syphilis, the positive Wassermann reaction and other evidence persist. In some syphilitic newborns the Wassermann reaction may be negative up to the age of 3 months; if the child's signs or the mother's Wassermann reaction or history suggests syphilis, the test should be repeated at the ages of 3 and 6 months. These reversals are more frequent in the offspring of treated mothers. After the age of 3 months, with very few exceptions, a persistently positive Wassermann reaction in a child indicates syphilis and a persistently negative reaction excludes the possibility.

15. Brooks, B. U.: A Study of Infant Mortality in the Southern States, South. M. J. 23: 869-875 (Oct.) 1930.

16. The National Congress of Parents and Teachers: The Summer Round-Up of the Children, Washington, D. C., 1934.

11. Gengenbach, S.: Standards of Prenatal Care.
12. Skeel, A. J.: Prevention of Gonorrheal Ophthalmia in the Newborn, J. A. M. A. 111: 143-144 (July 19) 1938.
13. Swendsen, J. J., and Lee, S. R.: Impetigo Contagiosa Neonatorum, J. A. M. A. 96: 2081-2085 (June 20) 1931. Guy, W. H., and Jacob, F. M.: The Prophylaxis of Impetigo Neonatorum, J. A. M. A. 102: 840-841 (March 17) 1934.

it is profitable and economical to take a Chevrolet or a Ford costing \$700 to a garage at intervals for inspection and adjustment, should not the public be educated by publicity¹ to take a child with a potential value of \$10,000, according to some estimates, to a physician for periodic examinations?

Infant Feeding.—An infant should be breast fed for the first six months. Between the ages of 8 days and 3 years all children should be given daily from two to four teaspoonfuls of cod liver oil and from two to four tablespoonfuls of tomato or orange juice, or their equivalent substances. Diseases and deaths among breast fed infants are lower than among those artificially fed.¹⁷ For weaning, evaporated (unsweetened) milk diluted with water and lactic acid and containing added sugar or Karo is digestible, safe and cheap. The use of lactic acid milk, because of its bactericidal action, has reduced the mortality from diarrhea and dysentery.¹⁸ The home instructions for its preparations are simple.¹⁹ The transition from breast or lactic acid milk feedings to a general diet should be made gradually from the fifth to the eighth month of age by adding one article of food at a time. For example, from one to four tablespoonfuls of cooked cereal should be fed once or twice daily before the bottle feedings at the age of 5 months, from one to four tablespoonfuls of finely chopped cooked meat or one egg daily at the sixth month, and so on, until by the age of 1 year the child is receiving a general well balanced diet. Every infant and child should be given as much fluid as possible, especially during hot weather. Because of their high salt content, bouillon cubes dissolved in a cup of hot water and then cooled should be given frequently during the summer.

Immunization.—At the age of 3 months infants should be vaccinated on the leg against smallpox. Reactions, complications and contaminations are less frequent at this early age. At the age of 4 months infants should be inoculated at weekly intervals with three doses of whooping cough vaccine. At the age of 9 months they should be protected against diphtheria with three doses of diphtheria toxoid or alum-precipitated toxoid at intervals of three weeks. Combined diphtheria and tetanus toxoid also is being used. Three

months later, and also annually thereafter, Schick tests should be done. If they are positive, the toxoid injections should be repeated. Unless combined diphtheria and tetanus toxoid has been given, three injections of alum-precipitated tetanus toxoid at intervals of two months are recommended at the age of 1 year.²⁰ If the child has not been thus immunized, tetanus antitoxin should be administered if severe cuts or wounds occur. Tetanus neonatorum can be eliminated by clean obstetrics and midwife control.²¹ Any one bitten by a mad dog, or one suspected of being mad, should receive the Pasteur treatment. If a child is exposed to measles, chickenpox or mumps, injections of blood from persons who have recovered from these diseases may be used. Immune globulin (human) also may modify measles. Children who live in districts in which scarlet fever is prevalent or severe can be protected against this disease if at the age of 1 year five doses of scarlet fever toxin are administered at weekly intervals and a Dick test is made two months later to determine the efficacy of the immunization. The Dick test should be repeated annually, as reinmunization may become necessary. At the age of 1 year children should be immunized with three injections of typhoid-paratyphoid vaccine at intervals of seven days. Typhoid and paratyphoid fever, though the death rate is decreasing in cities,²² still are a menace because of automobile travel and the dispensing of cold drinks in open water-filled containers, which frequently are contaminated by the hands of customers and clerks, some of whom may be carriers.²³

Deficiency Diseases.—In addition to those already cited, the other diseases listed in table 3 can be prevented. Malnutrition, nutritional and feeding disturbances, dehydration, anemia and the deficiency diseases (pellagra, rickets, scurvy, carious teeth and tetany) do not occur if the diet and amount of fluid are adequate.

Automobile Accidents.—Such occurrences are preventable, especially for children, who should be taught at home and at school to take precautions constantly.

Brucellosis (undulant or Malta fever).—This infection and other milk-borne diseases, e.g. tuberculosis, typhoid-paratyphoid A and B and streptococcal sore throat, often would be prevented by the rigid observance of the standard milk ordinance, the pasteurization of sweet milk and the use of whole lactic acid evaporated milk.¹⁸

The Spread of Dysentery and Summer Diarrhea.—This can be prevented by the following measures: the feeding of whole lactic acid evaporated milk mixtures to infants under 2 years of age; the pasteurization of sweet milk, butter and cheese fed to children; the thorough washing of the mother's or attendant's hands with soap and water every time she has been in contact with excreta of a person suffering from diarrhea of any form, or before she handles food for children; the keeping of excreta and soiled clothing of patients suffering from diarrhea in covered buckets containing soap pow-

17. Grulee, C. G.; Sanford, H. N.; Herron, P. H.; Schwartz, Harry, and Kantor-Amtman, Jennie: Breast and Artificially Fed Infants: A Study of the Morbidity and Mortality of Twenty Thousand Infants, J. A. M. A. 103:735-739 (Sept. 8) 1934, 104:1986-1988 (June 1) 1935; J. Pediat. 6:825-829 (June) 1935; Bull. Assoc. internat. de pediat. prévent. 2:3, 1935.

18. Rothey, K. B.: Is the Benefit of Lactic Acid Milk in Infant Feeding Due to the Bactericidal Action of Lactic Acid? J. Pediat. 7:60-64 (July) 1935. Scheuer, L. A.: The Use of Lactic Acid Milk in the Prevention of Summer Diarrhea, J. Pediat. 7:468-471 (Oct.) 1935. Davison, W. C.: Elimination of Milk-Borne Disease, Am. J. Dis. Child. 40:72-78 (Jan.) 1935.

19. In the preparation of lactic acid evaporated milk, the contents of a 7 cent can of unsweetened evaporated milk (390 cc., or 13 ounces) are poured into a clean quart milk bottle previously scalded with boiling water, and the empty can is nearly filled with boiling water, in which then are dissolved one teaspoonful of lactic acid (U. S. P.) and three level tablespoonfuls of sugar. As soon as this solution is cold it is poured slowly into the quart milk bottle containing the unsweetened evaporated milk, while shaking the bottle constantly. Although not necessary, it is advisable, if the lactic acid is to accomplish its full bacterial effect, to keep the mixture six hours, preferably though not necessarily in a cold place, before it is fed in required amounts to the infant.¹⁸ It should not be boiled or pasteurized, as it will curdle. Infants of any age can be fed 100 cc. (100 calories) of this mixture per kilogram of body weight (1½ ounces [45 calories] per pound) divided into from four to six feedings. If a child requires more than this amount (one can each of milk and water, a total of 780 cc., or 26 ounces) he also needs solid food. For premature, weak and very young infants, who occasionally vomit this formula, a small 5 cent can of unsweetened evaporated milk (160 cc., or 5½ ounces) may be added to two canfuls of water, one teaspoonful of lactic acid and two level tablespoonfuls of sugar; the mixture then contains 67 calories per hundred cubic centimeters or 20 calories per ounce, and 150 cc. per kilogram of body weight (2½ ounces per pound) is required in twenty-four hours. A few infants thrive better on cultured whole lactic acid milk than on the evaporated variety.

20. McBryde, Angus: Tetanus Immunization with Alum-Precipitated Toxoid, South. M. J. 30:565-567 (June) 1937. Cooke, J. V.: Combined Active Immunization for Diphtheria and Tetanus: A Plea for Its Routine Use, *ibid.* 31:158-161 (Feb.) 1938. Jones, F. G., and Moss, J. M.: The Response of Human Subjects to an Injection of Tetanus Toxoid or Tetanus Alum-Precipitated Toxoid One Year After Immunization, J. Immunol. 53:183-190 (Sept.) 1937.

21. Bassett, V. H.: Prevention of Tetanus Neonatorum, Tr. South. Branch, Am. Pub. Health A., Nov. 30 and Dec. 1, 1937.

22. Typhoid in the Large Cities of the United States in 1937, J. A. M. A. 111:414-418 (July 30) 1938.

23. Report of the Committee on Immunization Procedures of the American Academy of Pediatrics, January 1938.

der and water until they can be boiled; the screening of houses, and the use of mosquito nets for the beds of children to prevent the access of flies.

Malaria.—This can be prevented by eliminating mosquitoes, by cleaning up and draining swamps, pools and collections of standing water and by screening houses and sleeping quarters.

Poisoning.—The sale of lye and other caustics without a prominent label should be prohibited by law.²⁴ All poisons should be plainly labeled and kept out of reach of children.

Poliomyelitis.—No benefit from vaccination has been proved, but during an epidemic children under 12 years of age should avoid crowds, swimming pools and indoor contacts with other children and especially with adults, many of whom may be carriers.²⁵ The crippling effects of the disease can be greatly reduced by adequate orthopedic care, which now is available under the crippled children's program supported by the United States Children's Bureau and state health departments.

Respiratory Infections.—The death rate directly or indirectly resulting from colds and respiratory infections is appallingly high. It is essential to remember that the cause of colds, which precede more severe infections, is exposure to an infected person. The inference is plain. The child should be protected from those who are suffering from colds by minimizing exposures and the use of cotton flannel face masks. The system of allotting teachers to schools on the basis of pupil days instead of pupil enrolment increases the spread of respiratory infections because many teachers do not realize the risk in urging the attendance of children who have "just a slight cold." If these children were kept in bed at the onset of the illness recovery would be more rapid, contact cases would be avoided and the pupil days would be increased.²⁶ If the adenoids and tonsils are frequently infected, as indicated by recurring sore throats and enlarged cervical lymph nodes, they should be removed.

Tuberculosis.—Every one must be instructed not to expectorate or cough while near children or to kiss them. Any member of the family, servant, nurse or any other person who comes in contact with children should be carefully examined by x-rays for tuberculosis if such a person has a chronic cough, however mild. Tuberculosis in children can be prevented only if those who have the disease can be kept away. Women with active tuberculosis should not have children. Tuberculin tests should be made on every one. If negative, the test should be repeated annually. If positive, a physical and bacteriologic examination, and chest roentgenograms should be made so that those who have active or incipient infections may have adequate sanatorium or preventorium care. Contacts also should be examined to determine the source of the infection. Literature about this disease should be obtained from health departments and tuberculosis sanatoriums.

Mental Hygiene.—Last but not least, this is one of the most important phases of preventive pediatrics. Although not a factor in infant mortality, mental health problems, because of wrecked lives, often are as serious as those of physical health. Proper habit training, especially in eating and sleeping, child guidance and

parental education²⁷ are essential. A harmonious home and a congenial environment also are necessary; juvenile delinquency is largely a product of the home. A disorderly emotional life must be recognized and corrected as early as possible. The school load should be reduced; the average child spends thirty hours a week in school and from ten to fifteen hours in additional home work. Kindergartens should be compulsory to accustom a child to companionship. The relationship of pediatrics to mental hygiene should be as close as possible.²⁸

SUMMARY

The thirty-seven conditions which cause 56 per cent of the annual 240,000 deaths among American children can and will be prevented if the public is educated by publicity¹ to utilize the resources of the medical profession, which are already available in many communities and being established in others. Especially is this true of the measures for better antenatal and natal care.

The pediatrician must continue to lead in preventive measures and must also include mental hygiene and adolescent problems in his field.

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27. Child guidance is bettering the adjustment of children to their immediate environment, with special reference to their emotional and social relationships, to the end that they may be free to develop, to the limit of their individual capacities, to well balanced maturity. This function is exercised through the direct study and treatment of maladjusted children and the spread of the mental hygiene attitude throughout the agencies responsible for child care. Child guidance also helps the child by promoting parental understanding of and sympathy for his problems and by giving him, in the later years of childhood, a directive insight into his own behavior, thus affording a basis for the prevention of psychoses. Clinics for this purpose usually require pediatricians, psychiatrists, psychologists and social workers, but a family physician or pediatrician usually can, if as interested as he should be, produce satisfactory results. The child's past history, parents, socio-economic factors, home surroundings and school associations should be studied for emotional attitudes and evidence of adjustment and maladjustment. The child's confidence should be obtained and mental and performance tests made. Every maladjusted child has one or more problems and his behavior is an attempt to solve them. The physician's task is to learn the nature of these problems (such as fear of teachers or worry over unhappy homes) and by friendly explanation to help the child to meet them. Education of the parents in the training of children is, or should be, part of the pediatrician's duty. They should be taught to have a happy, healthy relationship to the child, which will tend toward the development in him of such habits, patterns of conduct and mental attitudes that he will attain independence and normal control of his own emotions and habits. Bad habits often are developed by devoted but misguided mothers and grandparents who try to live the child's life for him. Infants should have interesting, loving care and the consistent, prompt response to their needs. However, rocking children to sleep, rubber pacifiers and evening amusements may be harmful. (Preston, M. L.: Child Guidance in Outpatient Pediatrics, *J. Pediatr.* 7: 452-464 [Oct.], 1933. Richards, E. L.: Child Guidance Clinics, New York, Common Behavior Aspects of Child C. 1932. Kanner, Leo: Child Thomas, Publisher, 1935. *Jers Between Preschool Children*, New York, Teacher's College, D. Appleton-M. B.: Growth: A Study of Johnny and Jimmy, New York, D. Appleton-Century Company, Inc., 1935. Gesell, A. L., and Ilg, F. L.: The Mental Hygiene of Behavior of Infants: A Pediatric Approach to the Mental Hygiene of Early Life, J. B. Lippincott Company, 1937. Aldrich, C. A., and Aldrich, M. M.: Babies Are Human Beings, New York, Macmillan Company, 1938). Adolescence is one of the greatest of pediatric problems for children at puberty are subjected to physiologic, physical and psychic changes with marked exaggeration of sex impulses and emotions, and in addition they must adjust themselves to society by going from the period of parental control through a period influenced by emotions to adult life, which is or should be controlled by reason. Mental strain should be avoided and parents should not set intellectual goals which are too high for these children. Nine hours of sleep, one hour of mild outdoor exercise, a 4,000 calorie diet for boys and a 3,000 calorie diet for girls should be insisted on, and excitement and entertainments should be minimized. Overexercise and strenuous competitive athletics are harmful during this period. The family physician or pediatrician, if he can and will spend time and thought on the psychologic and social implications involved, should instruct the preadolescent child and his parents in sex development and the transition period and in a healthy normal attitude toward it.

28. Aldrich, C. A., and Veeder, B. S.: An Outline of the Pediatric's Relation to Mental Hygiene, *J. Pediatr.* 9: 323 (Sept.) 1936; *Am. J. Child.* 52: 1021-1026 (Oct.) 1936. Wolff, Ernst: Trends in Child Psychiatry, *J. Pediatr.* 10: 90-97 (Jan.) 1937. Friedjung, J. E.: Nervous Disturbances in School Children, *Wien. klin. Wchnschr.* 46: 83 (July 14) 1933. Sullenger, T. E.: Juvenile Delinquency a Product of the Home, *J. Crim. Law & Criminol.* 24: 1088, 1934. Gregory, M. S.: Psychiatry and the Problem of Delinquency, *Am. J. Psychiat.* 91: 773 (Jan.) 1935. Richards, E. L.: Behavior Problems of the Pediatrician, *M. Clin. North America* 18: 1663 (May) 1935. Wallace, Raymond: Relationship Between Emotional Tone of the Home and Adjustment Status, *J. Juvenile Research* 19: 295 (Oct.) 1935. Dawson, W. S.: Psychoses of Adolescence, *Brit. M. J.* 2: 651 (Oct. 12) 1935. J. S.: A Psychiatrist's View of the Problem of Prevention in Pediatrics, *South. M. J.* 30: 290 (March) 1937. Williams, J. F.: The Prevention of Nervous and Mental Disorders, *M. J. Australia* 1: 387 (March 11), 419 (March 20) 1937. Casparis, Horton: Some of the Aspects of the Mental Health Problem, *J. A. M. A.* 106: 2297-2303 (June 27) 1936.

24. Martin, J. M., and Arena, J. M.: Lye Poisoning and Stricture of the Esophagus: Report of Fifty Cases, *South. M. J.* 22: 286-290 (March) 1929.

25. Davison, W. C.: Poliomyelitis: A Résumé, *Am. J. Dis. Child.* 52: 1158-1178 (Nov.) 1936.

26. London, A. H., Jr.: Personal communication to the author.

KARAYA GUM (INDIAN GUM)
HYPERSENSITIVITY

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To Dr. Stearns S. Bullen,¹ of Rochester, N. Y., belongs the credit of first calling attention to karaya gum as an allergen, in reporting a case of perennial hay fever from this substance. The patient was a woman, and the source of the karaya gum was the wave set material used on her hair. The following year Feinberg² reported a case of asthma due to karaya gum. Recently, through personal communication, I have learned of additional cases of sensitivity to the gum from Dr. Ralph Bowen, of Oklahoma City,³ Dr. John Mitchell,³ of Columbus, Ohio, and Dr. John Sheldon,³ of Ann Arbor, Mich. To the reported cases, I here add sixteen cases from my own practice.

Attention is again called to karaya gum because of its widespread use in wave sets, the substance having almost supplanted flaxseed, quince seed, tragacanth and acacia for this purpose. The powdered gum may be obtained from any wholesale drug house and is comparatively cheap. Skin tests are readily performed by the scratch method using the moistened gum powder or a drop of any suspected wave set material. Intracutaneous test material can be made by dissolving a few granules of the gum in buffered saline solution and then sterilizing through a Seitz filter.

In addition to inhalation of karaya gum from the flaking of dried wave set material when the hair is combed, I sometime ago discovered that symptoms could be caused by ingestion. One of my patients with perennial hay fever reported a sharp attack of atopic coryza after eating a gelatin preparation which was found to contain the gum. A little later I asked her to swallow some of the gum mixed with food (mashed potato). Within a few moments after she swallowed a mouthful of the mixture there occurred a pronounced attack of atopic coryza and considerable epigastric discomfort. The patient was careful not to inhale any of the powdered gum. As will be related, several other patients have had definite symptoms from the ingestion of karaya gum.

Some of the known sources of contact with karaya gum are presented in table 1.

In the course of routine testing with karaya gum since Bullen's first publication, I have encountered sixteen instances of hypersensitivity to the gum, all in women. In seven cases no other reactors were given. The symptoms caused were perennial hay fever (atopic coryza), asthma, atopic dermatitis and gastrointestinal distress. All patients reacted strongly by scratch test: I have found no instances of reaction to intracutaneous test where the scratch test was not positive. Passive transfer tests gave definite positive reactions to karaya gum in the four cases in which they were attempted. The family history was positive for allergy in fourteen of the sixteen cases. A brief synopsis of the cases is presented in table 2.

Karaya gum as sold commercially is a fine white powder with an odor somewhat like that of acetic acid. It is entirely soluble in water, forming an adhesive

mucilage more viscous than acacia. According to the twenty-second edition of the U. S. Dispensatory the name karaya, or Indian gum, has been applied to a number of substances, including Bassora gum, Sterculia gum and ghatti gum, which are derived from similar species of tropical trees. In India this gum is employed as a sizing agent in the calico printing industry.

In a recent article by Prof. A. C. Ivy⁴ the following statement is made relative to the nature of the gum:

Karaya gum is collected from the bark of a tree of the *Astragalus* species (*Sterculiaceae*). It is sometimes referred to as false or Indian tragacanth or *Sterculia* gum. It belongs to the general group of gums known as bassorin gums. However, complete information regarding the chemical and physical properties of karaya gum is not available in the literature. According to Pringsheim⁵ the literature dealing with the gums and mucilages is very inaccurate and conflicting. Norman⁶ states that no essential difference exists between gums and hemicelluloses; in both, hexose and pentose are linked with uronic acid. Solis-Cohen⁷ gives arabin, bassorin and cerasin as the proximate principles of gums. Gums are chiefly pentosans. Many gums and vegetable mucilages, when dry, have the property of imbibing relatively large quantities of water. Porges,⁸ using a mucilage of the bassorin type, found that it

TABLE 1.—Known Sources of Contact with Karaya Gum

Gum drops and candies with soft centers, such as jelly beans
Kara jel
Fillers for ice creams; prepared ice cream powders
Certain brands of gelatin and junket
Many hand lotions
Hair-fixing (wave set) solutions
Many emulsified mineral oils and laxatives
Diabetic foods, including soy bean and almond waters
Tooth pastes: (A) Listerine; (B) Lactona
Denture adhesive powders: (A) Dr. Wernel's powder; (B) Dent-a-firm; (C) Denture powder; (D) Stix
Fillers for lemon, custard and other factory made pies
Commercially prepared ices and flavor emulsions
Some salad dressings
Laxatives:
Karaba (Battle Creek Sanitarium)
Karabim (George A. Brown & Co.)
Saraka (Scherling)
Mucara (John Wyeth)
Imbicol (Upjohn)
Bassoran (Merrell)

imbibed about three times more water than linseed or psyllium seed and five times as much as agar. Parsons⁹ and Klecker¹⁰ reported that the bassorin they used absorbs slightly more than two times more water than agar.

The report on the analysis made for me of two samples of karaya gum is as follows:

Sample 1. 1 Gm. of gum contains 11.45 mg. of nitrogen, 8.45 mg. of nonprotein nitrogen, 3.0 mg. of protein nitrogen and 0.0019 mg. of protein.

Sample 2. 1 Gm. of gum contains 10.44 mg. of nitrogen, 7.21 mg. of nonprotein nitrogen, 3.23 mg. of protein nitrogen and 0.002 mg. of protein.

It thus appears that karaya gum contains approximately 0.1 per cent total nitrogen.

Recently several commercial firms have marketed laxatives with karaya or some similar gum of the

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1. Bullen, S. S.: Perennial Hay Fever from Indian Gum (Karaya Gum), *J. Allergy* 5: 484 (July) 1934.

2. Feinberg, S. M.: Karaya Gum Asthma, *J. A. M. A.* 105: 505 (Aug. 17) 1935.

3. Personal communication to the author.

4. Ivy, A. C., and Isaacs, Bertha L.: Karaya Gum as a Mechanical Laxative: An Experimental Study on Animals and Man, *Am. J. Digest. Dis.* 5: 315 (July) 1938.

5. Pringsheim, Hans: Chemistry of the Monosaccharides and Polysaccharides, New York, McGraw-Hill Book Company, 1933.

6. Norman, A. G.: The Chemical Constitution of the Gums, *Biochem. J.* 23: 524 (No. 3) 1929.

7. Solis-Cohen, Solomon, and Githens, T. S.: Pharmacotherapeutics, Materia Medica and Drug Action, New York, D. Appleton & Co., 1928.

8. Porges, M.: Treatment of Constipation with Normacol, *M. J. & Rec.* 128: 89 (July 18) 1928.

9. Parsons, F. B.: Constipation and Mechanical Laxatives, *Practitioner* 129: 70 (July) 1932.

10. Klecker, Ernst: Eine Methode zur Messung des Quellungsvermögens pharmakologisch verwendeter Quellstoffe, *Arch. f. exper. Path. u. Pharmacol.* 161: 596 (Aug. 22) 1931.

bassorin type as the principal constituent. In the article by Ivy⁴ this statement appears:

Karaya was administered in the form of granules under the trade name of "Mucara" to eighty-nine graduate and medical students, nurses and social workers (forty-six were female, forty-three were male). Each subject kept an accurate account of all food and fluids taken for seven days. This diet was then repeated on the same days of the following week with the addition of one heaping teaspoonful of Mucara taken once daily

bute some or all of their symptoms to the frequent ingestion of the gum. Then too I wish to stress the widespread consequences of the indiscriminate use of these bassorin laxatives by unsuspecting allergic persons. The literature advertising Mucara states that "Mucara is a useful, harmless agent for the management of simple constipation," and yet three of the four patients of mine who were given karaya gum to swallow were made ill by it.

TABLE 2.—Synopsis of Cases of Karaya Gum Sensitivity

Case No.	Patient	Age, Yr.	Family History of Allergy	Source of Contact	Chief Symptoms	Results of Test	Other Reactors	Comment
1	Mrs. E. H. M.	31	Positive	Wave set, licorice, gum drops, listerine tooth paste	Perennial hay fever, eczema of ear lobes, asthma, chronic indigestion	Cutaneous ++++ Intracutaneous ++	June grass, English plantain, cottonseed	Nausea, epigastric pain and hicough for 2 days after swallowing 2 teaspoonfuls of mucara
2	Miss L. M.	21	Negative	Agar-psylla? gum drops	Atopic dermatitis (generalized)	Cutaneous ++++ Intracutaneous +++ Passive transfer positive	None; foods?	Nausea, vomiting, diarrhea, cramps and flare-up of dermatitis after swallowing 2 teaspoonfuls of bassorin
3	Mrs. O. A.	27	Positive	Wave set	Perennial hay fever, asthma	Cutaneous ++++ Intracutaneous +++	Wheat, orris, flaxseed	Gum sensitivity not of major importance
4	Miss V. M.	16	Positive	Wave set	Atopic dermatitis (generalized)	Cutaneous ++++	Cereals, pollens, quince seed, cottonseed, kapok seed, flaxseed, silk	Gum sensitivity one of several factors
5	Mrs. G. C. W.	40	Positive	Wave set every week	Seasonal hay fever, perennial asthma	Cutaneous ++++	Ragweed, cat hair, house dust	Severe asthma from inhaling powdered karaya gum
6	Mrs. A. W.	36	Positive	Wave set	Asthma	Cutaneous ++++	Cat hair, shop dust	Asthma chiefly due to shop dust; polishes cutlery with flannel cloths
7	Mrs. L. D. L.	35	Positive	Wave set	Contact dermatitis, perennial hay fever	Cutaneous ++++ Intracutaneous ++	Positive patch test to fur dye	Patch test negative with karaya gum; atopic coryza from inhaling powdered gum
8	Mrs. H. C. D.	26	Positive	Wave sets, ice cream	Perennial hay fever, dermatitis of eyelids, face and arms	Cutaneous ++++ Intracutaneous ++++ Passive transfer positive Patch negative	None	Severe atopic coryza and abdominal cramps from ingestion of karaya gum
9	Mrs. C. Z.	23	Positive	Wave set, jelly beans, gum drops	Atopic dermatitis (generalized)	Cutaneous ++++ Intracutaneous ++++ Passive transfer positive	Cereals, pollens, silk, horse dander	Ate jelly beans frequently
10	Miss E. C.	34	Positive	Wave set material used in occupation	Perennial hay fever, dermatitis of eyelids, neck, arms	Cutaneous ++++	None	Beauty parlor operator
11	Miss M. D.	37	Positive	Wave sets, ice cream	Perennial hay fever	Cutaneous ++++	Ragweed, quince seed, horse dander	Karaya gum source of non-seasonal atopic coryza
12	Mrs. A. H.	22	Positive	Wave set	Perennial hay fever, dermatitis of eyelids	Cutaneous ++++ Intracutaneous ++	None	Violent sneezing and asthma from inhaling powdered gum
13	Mrs. C. C.	61	Positive	Gum drops	Dermatitis of eyelids and antecubital spaces	Cutaneous ++++	None	No recurrence of symptoms since avoiding gum drops
14	Mrs. J. F.	58	Positive	Wave sets	Seasonal and perennial hay fever	Cutaneous ++++	Ragweed	Symptom free through avoidance of gum contact
15	Mrs. W. L.	36	Negative	Wave set	Perennial hay fever	Cutaneous ++++	None	Symptom free through avoidance of gum contact
16	Mrs. G. J.	28	Positive	Gum drops, gelatin products	Dermatitis of hands, forearms and ears; rose fever	Cutaneous +++ Intracutaneous ++ Patch negative	House dust, horse dander, grass pollens	Formerly owned beauty parlor; no effect from swallowing bassorin; dust probably chief allergen

after the evening meal (9 Gm. Mucara equal approximately 7 Gm. karaya). . . . Seven, or 7.8 per cent, complained of some abdominal discomfort associated with distention shortly after taking Mucara. Three, or 3.4 per cent, complained of mild abdominal cramps while taking the Mucara.

Professor Ivy then went on to say that he was at a loss to account for the abdominal symptoms occasioned in these seven persons by the ingestion of the karaya gum. My own thought is that they were possibly mildly hypersensitive to the gum through having previously swallowed it as an ingredient of some food or confection.

I quote from Ivy's article to call attention to ingestion as a very prevalent means of contacting the bassorin gum—just as important a source as inhalation. In my series of sixteen, seven of the patients could attri-

Karaya and related gums of the bassorin type are not harmless agents but may cause severe symptoms in the allergically susceptible by inhalation or ingestion.

SUMMARY

1. Sixteen cases, in addition to those before reported, of hypersensitivity to karaya gum were observed.

2. The chief presenting symptoms were perennial hay fever (atopic coryza), asthma, atopic dermatitis and gastrointestinal distress.

3. Ingestion, as well as inhalation, is a means of contacting the allergen.

4. The indiscriminate employment of karaya gum as a supposedly harmless laxative, especially for persons susceptible to allergic sensitization, should be avoided.

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THE PROTHROMBIN IN THE BLOOD
OF NEWBORN MATURE AND
IMMATURE INFANTS

AS DETERMINED BY THE MICRO PROTHROMBIN TEST

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The recent phenomenal progress in the knowledge of the antihemorrhagic factor, called vitamin K by Dam and Schönheyder,¹ and its influence on the prothrombin activation of the blood have brought into clear relief the etiologic relationship in which this vitamin stands to the hitherto obscure bleeding tendency frequently encountered in the neonatal period. As early as 1912 Whipple,² after conducting coagulation experiments on the heart's blood obtained at autopsy from an infant dying of melena neonatorum, stated in no uncertain terms that the absence of prothrombin in the blood constituted the underlying cause of this disease. Simply because the blood used in Whipple's experiments was collected after death, this striking conclusion, published over a quarter of a century ago, apparently remained unheeded. Whipple, in the necropsy protocol, stated that the blood was quite fluid and that no evidence was found of any clot formation in any part of the vascular system. In retrospect it must be admitted that his conclusion, while based on observations of only two cases, was entirely logical and correct.

The more definite development of our knowledge further confirming the observation cited dates from 1929, when Henrik Dam,³ in the course of biochemical investigations on sterol metabolism in chicks, first suspected the existence of vitamin K, since in the chicks on a fat-free diet hemorrhagic manifestations frequently developed. It was not, however, until satisfactory methods for quantitative estimation of prothrombin in the blood were evolved that the important role of this vitamin in the mechanism of blood coagulation began to be appreciated. In 1935 Quick, Stanley-Brown and Bancroft⁴ improved the older Howell's method by using a suspension of thromboplastin in excess and then recalcifying the oxalated plasma. By this method Quick and Grossman⁵ measured the prothrombin concentration of the blood in a few newborn babies and reported profound fluctuations occurring during the first forty-eight hours of life. Later Brinkhous, Smith and Warner,⁶ in

developing a two stage titration procedure, actually measured the prothrombin content of the plasma and observed that the prothrombin values of the twenty-one normal infants of varying ages were generally low throughout the first year of life, particularly those of newborn babies, ranging from 14 to 39 per cent of the level found in normal adult plasma. Owen, Hoffman, Ziffren and Smith,⁷ using a simpler technic first developed by Quick,⁸ demonstrated the same low level of prothrombin content in thirty-eight normal infants with a drop between the second and sixth days of postnatal life. Dam, Tage-Hansen and Plum⁹ endeavored to account for hypoprothrombinemia in newborn infants on the basis of vitamin K deficiency due to a defective absorption of the vitamin from the gastrointestinal tract.

More recently Waddell, Guerry, Bray and Kelley,¹⁰ in a published analysis of blood coagulation studies on two newborn infants having abnormally long prothrombin clotting time, reported the pronounced shortening of the clotting time following administration of vitamin K. Waddell and Guerry¹¹ further studied twenty newborn infants with special reference to the occurrence of unnatural bleeding. These infants were divided into two groups of ten each, one group serving as controls. The infants receiving no vitamin K therapy were found to show a prolonged prothrombin clotting time between the ages of 48 hours and 72 hours, whereas in those receiving the treatment the prothrombin clotting time was consistently shorter.

In this connection it is also of interest to know whether there exists any relation between the maternal and the fetal blood with respect to prothrombin concentration. As measured by the method of Warner, Brinkhous and Smith,⁶ Hellman and Shettles¹² reported extremely low prothrombin levels in nineteen full term normal infants and nine premature infants, particularly in the latter, in sharp contrast to the normal complement of prothrombin found in their respective mothers. By administering vitamin K to some of these mothers prior to delivery they increased the plasma prothrombin from 68 to 130 per cent of control values. The normal full term babies born to these mothers also gave prothrombin levels almost three times as high as the average values found in other infants. Again, by giving vitamin K to two premature infants after birth they caused the plasma prothrombin to be elevated by the fifth day to from three to six times the initial values. Using the Quick technic, Norris and Rush¹³ reported the prothrombin values of the maternal blood at delivery to be above normal (107 and 133 per cent for the undiluted and the 25 per cent diluted plasmas) and those of the babies' blood to be below normal (77 and 62 per cent for the undiluted and the 25 per cent diluted plasmas). On repeating the determinations from seven to fourteen days after delivery they noted a slight

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Dr. Maurice L. Blatt, chief pediatrician, the Premature Station, Cook County Hospital, and Dr. Frederick H. Falls, head of the Department of Obstetrics, Illinois Research and Educational Hospital, gave permission to use patients in their respective departments for these studies.

1. Dam, Henrik, and Schönheyder, Fritz: A Deficiency Disease in Chickens. *Proc. Soc. Exper. Biol. & Med.* **28**: 1355 (No. 4) 1934; *The Nature of the Chick: Occurrence and Chemical Nature*, **1**: 135 (May) 1935.

2. Whipple, G. H.: Hemorrhagic Disease: Septicemia, Melena Neonatorum and Hepatic Cirrhosis. *Arch. Int. Med.* **9**: 365 (March) 1912; *Hemorrhagic Disease: Antithrombin and Prothrombin Factors*, *ibid.* **12**: 637 (Dec.) 1913.

3. Dam, Henrik: Cholesterinstoffwechsel in Hühneriern und Hühnerchen. *Biochem. Ztschr.* **215**: 475, 1929; *Ueber die Cholesterinsynthese in Tierkörper*, *ibid.* **220**: 158, 1930.

4. Quick, A. J.; Stanley-Brown, Margaret, and Bancroft, F. W.: A Study of the Coagulation Defect in Hemophilia and Jaundice. *Am. J. M. Sc.* **190**: 501 (Oct.) 1935; *The Prothrombin in Hemophilia and in Obstructive Jaundice*, *J. Biol. Chem.* **109**: 1xxiii (May) 1935.

5. Quick, A. J., and Grossman, A. M.: Concentration of Prothrombin in Blood of Babies (Three to Seven Days Old). *Proc. Soc. Exper. Biol. & Med.* **40**: 647 (April) 1939; *Prothrombin Concentration in Newborn*, *ibid.* **41**: 227 (May) 1939.

6. Brinkhous, K. M.; Smith, H. P., and Warner, E. D.: Plasma Prothrombin Level in Normal Infancy and in Hemorrhagic Disease of the Newborn. *Am. J. M. Sc.* **193**: 475 (April) 1937; *Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: Quantitative Study on Blood Clotting: Prothrombin Fluctuations Under Experimental Conditions*, *Am. J. Physiol.* **114**: 667 (Feb.) 1936.

7. Owen, C. A.; Hoffman, G. R.; Ziffren, S. E., and Smith, H. P.: Blood Coagulation During Infancy. *Proc. Soc. Exper. Biol. & Med.* **41**: 181 (May) 1939.

8. Quick, A. J.: Determination of Prothrombin. *J. A. M. A.* **112**: 2552 (June 17) 1939; *Quick, Stanley-Brown and Bancroft*.

9. Dam, Henrik; Tage-Hansen, E., and Plum, P.: K-avitaminose hos spæde børn som årsag til hæmorrhagisk diathese. *Ugesk. f. læger* **101**: 896 (Aug. 3) 1939.

10. Waddell, W. W., Jr.; Guerry, DuPont, III; Bray, W. E., and Kelley, O. R.: Possible Effects of Vitamin K on Prothrombin and Clotting Time in Newly Born Infants. *Proc. Soc. Exper. Biol. & Med.* **40**: 432 (April) 1939.

11. Waddell, W. W., Jr., and Guerry, DuPont, III: Effect of Vitamin K on the Clotting Time of the Prothrombin and the Blood, with Special Reference to Unnatural Bleeding of the Newly Born. *J. A. M. A.* **112**: 2259 (June 3) 1939.

12. Hellman, L. M., and Shettles, L. B.: Factors Influencing Plasma Prothrombin in the Newborn Infant. *Bull. Johns Hopkins Hosp.* **65**: 138 (July) 1939.

13. Norris, R. F., and Rush, Alexander: A Comparison of the Prothrombin Levels of Maternal and Cord Blood at Delivery. *Surg., Gynec. & Obst.*, to be published.

increase in the prothrombin values in the babies' blood (89 and 82 per cent for the undiluted and the 25 per cent diluted plasmas), while no significant changes were observed in the mothers' blood.

The studies published, though few, clearly indicate the necessity of ascertaining the normal range of vari-

venous plasma. Since this method requires only an amount of whole blood (from 10 to 15 cu. mm.) small enough to be easily obtainable from simple skin puncture, the prothrombin tests can be readily carried out several times a day on the same infant. This micro adaptation of Quick's method may be briefly described as follows:

METHOD

Whole blood obtained from a deep skin puncture made on the heel of the infant and oxalated in the proportion of 1:500, using the double oxalate mixture in dry form as elsewhere described,¹⁵ was used throughout the entire investigation. Ten cu. mm. of well mixed oxalated blood is measured out by means of a combination microhemopipet,¹⁶ and the contents are expelled carefully either on a small watch glass or into the hollow of a test plate. A suspension of thromboplastin with a potency giving the prothrombin clotting time of about twenty seconds for normal adult blood is then added in the same amount, and this is followed immediately by the addition of the same quantity of 0.025 molar calcium chloride solution. After several seconds

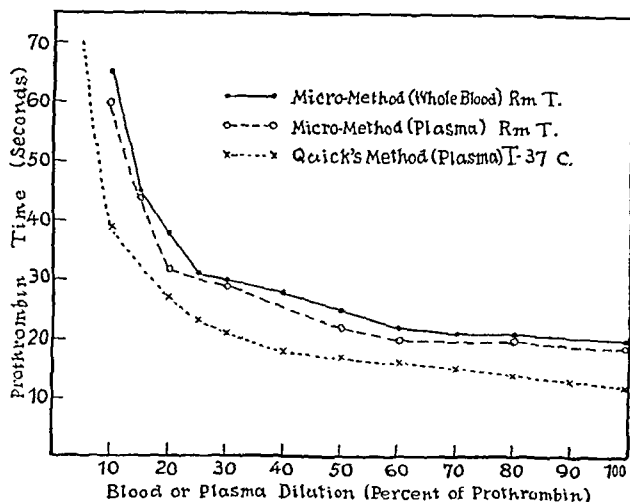


Chart 1.—Prothrombin dilution curves, showing a close correlation between the curves obtained by micro prothrombin test and that published by Quick.

ations in the prothrombin concentration of a large number of both mature and immature infants. The chief obstacle in undertaking an investigation of any magnitude in newborn infants is the difficulty of applying prothrombin methods, which require relatively large amounts of venous blood. Venipuncture in small infants necessitates entering either the superior longitudinal sinus or one of the jugular (external and internal) veins, a procedure which, while perfectly harmless in the hands of experienced workers, nevertheless is not

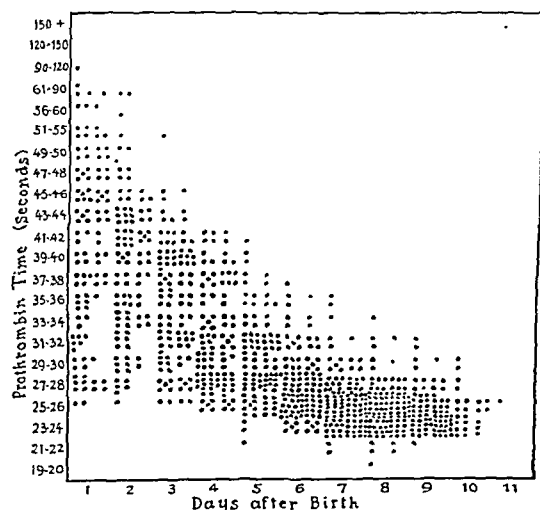


Chart 2.—Scattergram representing 894 tests of the prothrombin clotting time of 100 mature infants from birth to the eleventh day of life.

practical if the tests are to be performed at frequent intervals on the same infant. For this reason a new micro prothrombin method (Kato) was devised, following the general principle involved in Quick's original method¹⁴ but using the whole capillary blood instead of

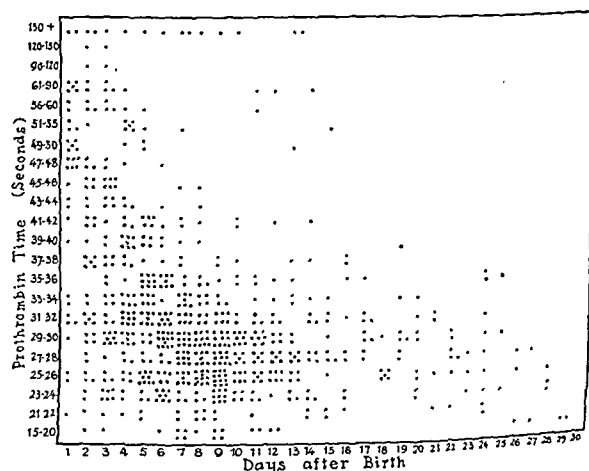


Chart 3.—Scattergram representing 701 tests of the prothrombin clotting time of seventy-three premature infants from birth to the twenty-ninth day of life. Note marked fluctuations in prothrombin time in this group.

of thorough agitation of the ingredients by means of a fine glass rod, the prothrombin clotting time is determined with a stop watch, computation starting with the time when the last ingredient is added and ending with the fixation of the mass by fibrin formation. Since the test is carried out at average room temperature, all reagents used must also be kept at this temperature. If the reagents are used at refrigerator temperature or at any temperature below that prevailing in the room, the prothrombin clotting time will be materially prolonged. The potency of the thromboplastin suspension may vary from time to time, and hence it is advisable first to determine the prothrombin time of normal adult whole blood and then to use the value so obtained as the basal level. Since prothrombin clotting time is greatly influenced by the potency of thromboplastin, it is absolutely essential to prepare the suspension strictly in accordance with the instructions elsewhere given, using the brain of a freshly killed animal.

15. Kato, Katsuji: Use of Combination Microhemopipet, with Special Reference to the Determination of the Sedimentation Rate, Packed Cell Volume and Icteric Index in Pediatric Practice, *Am. J. Dis. Child.*, to be published.

16. Kato, Katsuji: Combination Microhemopipet, *J. Lab. & Clin. Med.* 23: 980 (June) 1938.

14. Kato, Katsuji: Microprothrombin Test with Use of Capillary Whole Blood: A Simplified Modification of Quick's Quantitative Method, *Am. J. Clin. Path.*, to be published.

As determined by this method the prothrombin clotting time of normal adult capillary whole blood under optimal conditions is twenty seconds, with deviations of plus or minus two seconds. Since the test measures not the actual amount of prothrombin but rather the clotting time according to this particular coagulation

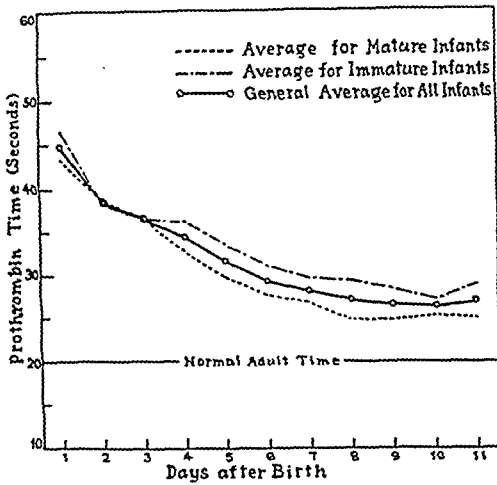


Chart 4.—Average values for prothrombin clotting time in mature and immature infants during the first eleven days of life. Cases with abnormally prolonged prothrombin time (over two minutes) have not been included in calculating these figures.

system, the "concentration" or "level" of prothrombin in the blood in the discussion of our data refers only to the results of computation based on the prothrombin dilution curve shown in chart 1.

Comparison of curves obtained by this method of using plasma prepared according to the method of Quick and oxalated whole blood reveals a satisfactory correlation of results. Because of the presence in it of blood cells which displace a corresponding proportion of plasma, whole blood naturally contains less prothrombin than plasma when the two are compared volume for volume. Thus it is reasonable to find the prothrombin time of plasma to be consistently shorter than that of whole blood. The clinical significance of the prothrombin time lies, however, not so much in the result of a single test, unless grossly abnormal, as in the trend of changes that ensue under various conditions. These curves also compare favorably with the prothrombin dilution curve reported by Quick,¹⁷ in which the shorter prothrombin time results chiefly from the effect of the higher temperature (37 C.) at which his test is carried out.¹⁸

Recently some investigators¹⁹ have found the optimal concentration of calcium chloride solution to produce the minimum prothrombin clotting time, by Quick's method, to be that of normal blood (0.0025 molar). But shortening of the time is disadvantageous in that the percentage of error becomes greater as the clotting time is shortened.

17. Quick, A. J.: The Nature of the Bleeding in Jaundice, *J. A. M. A.* 110: 1658 (May 14) 1939.

18. Interpretation of results obtained by various methods may be facilitated if the data expressed in absolute number of seconds are converted into relative number (prothrombin index) by using the equation:

$$\frac{\text{Prothrombin time of unknown blood}}{\text{Prothrombin time of normal adult blood}} = \text{Prothrombin index}$$

Under normal conditions this index is always unity, and values greater than 1.0 have longer prothrombin clotting time (low prothrombin concentration) and those less than 1.0 shorter prothrombin clotting time (high prothrombin concentration).

19. Pehle, F. J., and Stewart, J. K.: A Study of the Quick Method for the Quantitative Determination of Prothrombin with Suggested Modifications, *Am. J. M. Sc.* 195: 622 (Nov.) 1939.

RESULTS AND COMMENT

The present investigation was undertaken to determine the normal limits of prothrombin clotting time in the neonatal period as tested by the micro prothrombin method just described. A total of 173 newborn infants form the basis of our study. An aggregate of 1,595 prothrombin tests were made in duplicate at frequent intervals beginning on the day of birth and continued for varying periods up to four weeks. Using the customary figure of 2,500 Gm. of body weight as the division line, the infants studied may be classified into two groups, according to the degree of maturity at birth. By this criterion 100 infants were mature and seventy-three immature. The data are presented in terms of the actual number of seconds required for the clot formation in the coagulation system recommended for the test. The prothrombin clotting time in the mature infants was studied up to the eleventh day of life (chart 2), while in the immature group the observations covered much longer periods, in a few cases extending up to the age of 4 weeks (chart 3). When these data are averaged for each date of postnatal life we obtain the general average range of prothrombin time of newborn infants during the periods here studied (chart 4). There appears to exist no correlation between the degree of infants' maturity and the prothrombin convertibility of the blood, at least on the first day of life (chart 5).

From the data presented it is at once evident that the prothrombin clotting time of the blood of newborn infants is for the most part high, particularly on the first day of life, showing an average of 46.5 seconds for the premature and 43.2 seconds for the mature infants. This prolonged prothrombin time gradually improves as the infants grow older, so that by the end of the ninth or tenth day it averages twenty-five seconds

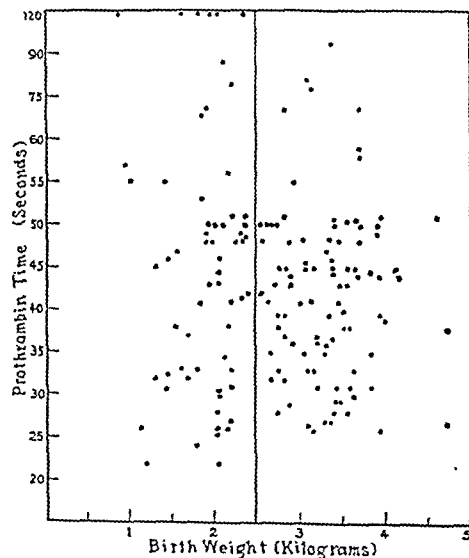


Chart 5.—Lack of correlation between birth weight and prothrombin clotting time.

in the full term, mature babies. In the premature group the same general rule holds, although among these infants there is a tendency for the prothrombin time to show much greater fluctuations than in the mature group. Also with many immature babies the prothrombin curve, instead of describing a gradual and uniform descent, frequently rises abruptly, pointing to

a lack of stability either in the prothrombin or in the prothrombin-antithrombin equilibrium. Some immature infants, on the other hand, may show unusually rapid activation of prothrombin in the blood, as evidenced by short clotting time even on the first day of life. Some typical examples of various prothrombin curves in individual babies are shown in chart 6.

The factors entering into the convertibility of the prothrombin are undoubtedly numerous. The most important single factor is probably the action of the antithrombin of the blood. Under normal conditions the antithrombin factor is physiologically balanced by the presence of proper amounts of thromboplastin. Also important in influencing the speed with which fibrin is formed are the quantity and reactivity of the fibrinogen. Likewise calcium undoubtedly plays a paramount role in blood coagulation. All these factors must be evaluated in order to interpret properly results such as have been presented.

The specific factors influencing the level of prothrombin in the blood are also of particular clinical significance. While the exact manner in which vitamin K acts on the concentration of prothrombin is not

encing our data. Further studies on the prophylactic use of antihemorrhagic vitamin by pregnant women are in progress.

The most important clinical significance revealed by the present study is the fact that the average newborn infant possesses a smaller fraction of prothrombin complement than an adult. This explains in a most satisfactory way the exact pathogenesis of hemorrhagic disease of the newborn, clinically known as melena neonatorum, in which the chief manifestation is frank hemorrhage from the mucous membranes of the gastrointestinal tract, genito-urinary surfaces and umbilical cord. In many of the patients suffering from this disorder who came under our observation the blood prothrombin was usually demonstrated to be below 10 per cent of the normal adult complement, giving a greatly prolonged prothrombin clotting time or none at all. A detailed study of these cases will be published in a subsequent report. Again, in certain cases of intracranial hemorrhage occurring at birth it is very likely that trauma or difficult labor may play only a provocative role, the fundamental factor being a reduced prothrombin convertibility of the blood, a condition which naturally renders the patient susceptible to severe bleeding on the slightest provocation. Recently autopsy in a fatal case of intracranial hemorrhage disclosed an extensive extravasation in the posterior fossa; but a prothrombin test of the blood of this infant performed several hours before death showed complete failure of the coagulation system. This and other observations we have made emphasize the great importance and desirability of determining the prothrombin clotting time of every newborn infant; or, if this is not possible, adequate prophylactic measures should be instituted as a precaution before the infant is born. The micro prothrombin method used in the present study has been found to be entirely suitable for general and routine use, indicating that all subclinical cases of prothrombin deficiency can be recognized early and at once properly treated. Since it is not possible by antepartum examination of the maternal blood to detect which infants will have a prothrombin deficiency, the administration of vitamin K to the mother shortly before delivery is suggested.

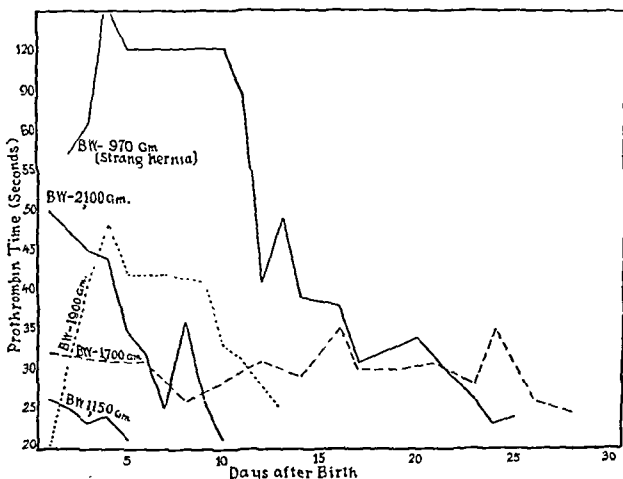


Chart 6.—Various types of prothrombin curves in individual babies.

clearly known, it is now generally agreed that intestinal absorption of this vitamin and normal functioning of the liver are the essential requirements for maintenance of a normal prothrombin level in the blood. Thus any pathologic changes produced either in the gastrointestinal tract or in the liver theoretically will, and actually do, diminish blood prothrombin, as evidenced by the fact that many types of liver diseases and intestinal disorders are often associated with a bleeding tendency. In one premature infant in our series showing prolongation of prothrombin time for many days, strangulated hernia developed. The hemorrhagic diathesis frequently developing in patients with obstructive jaundice has a slightly different pathogenesis in that the absence of bile in the intestine interferes with the normal absorption of antihemorrhagic vitamin.

Another possibly significant factor which may be responsible for the generally prolonged prothrombin time of the blood in the infants we have studied is the dietary habit of the mothers, a majority of whom came from families of the lower social strata. While no direct attempt was made to determine the possible vitamin K deficiency in the diet of these mothers, it is probable that this might have been an important factor influ-

SUMMARY AND CONCLUSIONS

The prothrombin clotting time of 173 newborn infants, both mature and immature, has been determined by the micro prothrombin method; an aggregate of 1,595 tests were made during the neonatal period, extending over four weeks of postnatal life.

The average prothrombin time of 100 mature infants on the first day of life was found to be 43.2 seconds; gradually shortening as the infants grew older, by the tenth day of life the average time was twenty-five seconds.

The average prothrombin time of seventy-three premature infants was 46.5 seconds on the day of birth and showed a much greater degree of fluctuation on subsequent days than that of mature babies. Also in this group were some infants whose prothrombin time actually increased after birth, and in one instance the prolonged prothrombin time of the blood was associated with strangulated hernia.

No correlation was found to exist between the degree of the infant's maturity and the prothrombin clotting time of the blood, at least on the day of birth.

The low prothrombin level of the blood in newborn infants satisfactorily explains the pathogenesis of

hemorrhagic disease of the newborn. This may be expressed clinically as hemorrhage into the gastrointestinal tract (melena, hematemesis) or bleeding from the cord (omphalorrhagia) or genito-urinary tract (hematuria). While in some cases of intracranial hemorrhage birth trauma was the precipitating factor, the severity of the bleeding was apparently induced by a lowering of the prothrombin level of the infant's blood.

920 East Fifty-Ninth Street—1819 West Polk Street.

LIESEGANG AND MUSCLE PRESSURE WAVES

EFFECTS OF MICROCAPILLARITY ON MICROCOMPRESSIONAL WAVES OF PHYSICOCHEMICAL CHANGES CAUSING LIESEGANG AND MUSCLE STRIAE

EBEN J. CAREY, M.D.

MILWAUKEE

The structural significance of the cross striae and their relationship to the function of skeletal and cardiac muscles are unknown, even though the problem has been investigated for more than a hundred years. The factors resulting in the formation of periodic stratification in gels of concentric rings and spirals in agate and gelatin (Liesegang,¹ Hardy,² Ostwald³ and many others) and the periodic bands in specially prepared gelatin in films and cylindrical columns in test tubes (Hatschek,⁴ Bradford,⁵ Küster,⁶ Hughes⁷) are still under investigation. Recently Raman and Subbaramiah⁸ and others have presented evidence that the Liesegang phenomenon may be interpreted in terms of a wave effect. No experimental attempt heretofore has been made to study comparatively the microscopic striations produced in specially prepared gels in microcapillary glass tubules and the cross striae of muscle. Evidence is presented that there is an underlying physicochemical wave mechanics in the production of both Liesegang and muscle striae.

My objectives in this paper are (1) to demonstrate variable wave patterns and wavelengths expressed as striae that accompany different chemical changes in gelatin when the reactions are concentrated and transmitted within the lumen of a microcapillary glass tubule, (2) to compare these microscopic Liesegang striae with those found in striated muscle under controlled experimental conditions and (3) to suggest the significance of this concept of wave mechanics in the normal and

abnormal motions of muscle, as previously suggested,⁹ during the transformation of chemical into mechanical energy.

METHODS

Transverse and spiral Liesegang striations are generated by the simple method of confining from 4 to 10 per cent gelatin plus either 0.5 to 1 per cent sodium chloride, sodium iodide, sodium bromide or potassium bichromate within microcapillary glass tubules from one-half to 2 inches long, with an inside diameter of from 25 to 100 microns. The tubules are then placed in from 5 to 10 per cent silver nitrate for from fifteen minutes to twelve hours, mounted on microscopic slides by sealing the tips with melted paraffin. Evanescent striae, which last from thirty minutes to one hour, are produced when 10 per cent gelatin plus 2 per cent uric acid dissolved in 2 cc. of 0.1 per cent solution of sodium hydroxide are confined in microcapillary tubules to the ends of which is placed 10 per cent hydrochloric acid (fig. 3). Many other inorganic and organic chemical reactions are studied in a similar manner in more than 1,000 microcapillary glass tubules, including those of living amebas, in which a cross striated orientation of the living granules can be periodically demonstrated.

Living intact rectus abdominis muscles of the skinned frog (*Rana pipiens*) were stimulated by sudden elevation in temperature from 20 to 37 C. for ten seconds, then depression to 4 C. for fifteen minutes, and also by mechanical stretch, electrical and various chemical means. The animals are quickly frozen for six hours and then placed in 10 per cent formaldehyde U. S. P. for twenty-four hours; the muscles are excised, embedded in paraffin, serially sectioned, mounted on glass slides and stained with hemalum and eosin. Directly controlled observations of the changes within the intact living muscle fibers are made with the ultra-paque microscope and water immersion lenses.

Traveling overlapping peristaltic waves in both the intact intestine and the pregnant uterus with normal intact blood supply in the living guinea pig are converted into a standing system of pressure waves by tying ligatures from one-half to 1 inch apart prior to stimulation by any one of the following means: the direct application of 1 per cent pilocarpine, acetyl choline, barium chloride crystal, mechanical stretch or electrical stimuli. Multiple reflections of the intestinal waves between the two ligatures result in a standing system by constructive interference.

RESULTS

Liesegang striae from 0.5 to 35 microns apart (fig. 1A) are found in the microcapillary glass tubules which contain silver iodide and from 4 to 60 microns in those with silver chloride (fig. 1D). The striae are finer and closer together near the ends of the tubule, where the diffusing silver nitrate is higher in concentration and where the frequency of reversible mass action of chemical change is greater than that in the middle of the tubule between the two ends.

Striae in muscle fibers subjected to sudden rise in temperature to 37 C. (fig. 1B) and those from mildly

9. Carey, E. J.: Tension of Differential Growth as a Stimulus to Myogenesis in the Intestine, *J. Gen. Physiol.* 2: 357 (March) 1920; Tension of Differential Growth as a Stimulus to Myogenesis in the Esophagus, *ibid.* 3: 61 (Sept.) 1920; Studies in the Wave Mechanics of Muscle: I. Vibratory Motor Nerve Ending and Related Radiation Patterns of Muscular Cross Striations, *Am. J. Anat.* 55: 259 (March) 1936; Studies in the Wave Mechanics of Muscle Form and Function: IV and V, *ibid.* 59: 89 (May) 1936; Studies in the Wave Mechanics of Muscular Motion: VII, *ibid.* 59: 365 (Sept.) 1936. Carey, E. J., and Zeit, Walter: Micro-Incineration of Active Smooth, Transitional and Skeletal Muscles, *Proc. Soc. Exper. Biol. & Med.* 41: 31 (May) 1939.

Mr. Leo Massopust assisted with the photomicrographs.
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1. Liesegang, R. E.: Ueber einige Eigenschaften von Gallerten, *Naturwiss. Wehnchr.* 11: 353, 1896; Die Achate, Dresden-Leipzig, T. Steinkopff, 1915; Spiralenbildung bei chemischen Niederschlägen, *Die Naturwiss.* 25: 645, 1930.

2. Hardy, W. R.: On the Mechanism of Gelatin in Reversible Colloidal Systems, *J. Physiol. Chem.* 4: 254, 1900.

3. Ostwald, Wolfgang: Die Welt der vernachlässigten Dimensionen, ed. 10, Dresden-Leipzig, T. Steinkopff, 1927.

4. Hatschek, E.: A Series of Abnormal Liesegang Stratification, *Biochem. J.* 14: 438, 1920.

5. Bradford, S. C.: Adsorptive Stratification in Gels: IV, *Biochem. J.* 14: 430, 1920.

6. Küster, Ernst: Ueber Zonenbildung in kolloidalen Medien, ed. 2, Jena, 1931.

7. Hughes, E. R.: An Analytical Study of Liesegang Rings, *Biochem. J.* 28: 1086, 1934.

8. Raman, C. V., and Subbaramiah, K.: Interference Patterns with Liesegang Rings, *Nature* 142: 355 (Aug. 20) 1938.

contracted muscle (fig. 1 *C*) at 15 C. are different in number in the fiber. Strongly contracted muscle has multiplication in the number of cross striations and rounded condensed nuclei (fig. 1 *B*) in contrast to those in the weakly contracted fiber. Reduction in the rate of chemical change by inducing hibernation through artificially cooling frogs and honey bees at 8 C. for from one to three weeks results in a progressive loss of cross striae in the muscle fiber. The muscle striae reappear when the temperature is raised to 20 C. within one to five hours. In irreversible strong muscle rigor the changes may be so great in parts of the muscle that the cytoplasm is arranged in homogeneous broad bands like Zenker's degeneration with the fine striae invisible. Phase amplitude and length differences in the underlying wave mechanics is microscopically detected by differences in the width and splitting of striae (figs. 1 *C* and 2 *B*). A vernier shifting effect of the muscle striae (fig. 1 *C*) and those striae of silver chloride (fig. 1 *D*) is evident. This may be due either to a spiral arrangement of striae or to a slight shifting of the wave front.

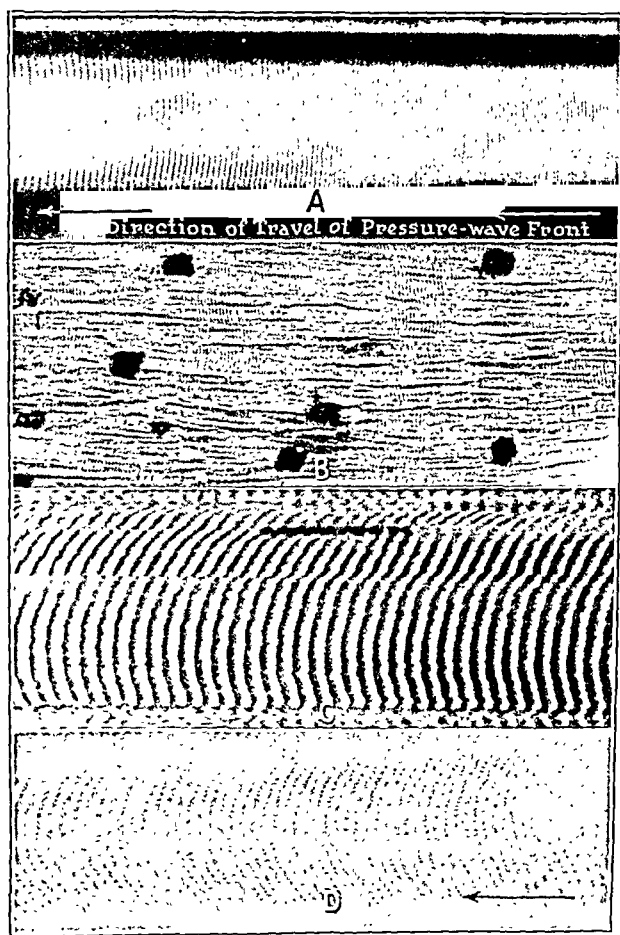


Fig. 1.—*A*, gelatin silver iodide striae within microcapillary glass tubule, inside diameter, 80 microns; reduced from a photomicrograph with a magnification of 260 diameters. *B*, strongly contracted muscle fiber, rectus abdominis of frog, compressed nuclei, fine striae with periodic beats of compact striae; original magnification 780. *C*, mildly contracted muscle fiber, rectus abdominis of frog, long nuclei, wide variable striae; original magnification 780. *D*, gelatin silver chloride striae within capillary glass tubule, inside diameter 80 microns; original magnification 260. Vernier shift of striae in *C* and *D*.

The spirality is the result of two simultaneous motions of the wave front: (1) translation and (2) rotation. Not all Liesegang and muscle striae, however, have a spiral arrangement.

A superpositional wave effect is detected (fig. 2 *A*) when silver iodide and chloride are produced simultaneously within the same microcapillary glass tubule. A fine dark band is frequently found in the middle of the light one (fig. 2 *A*), giving the effect observed at

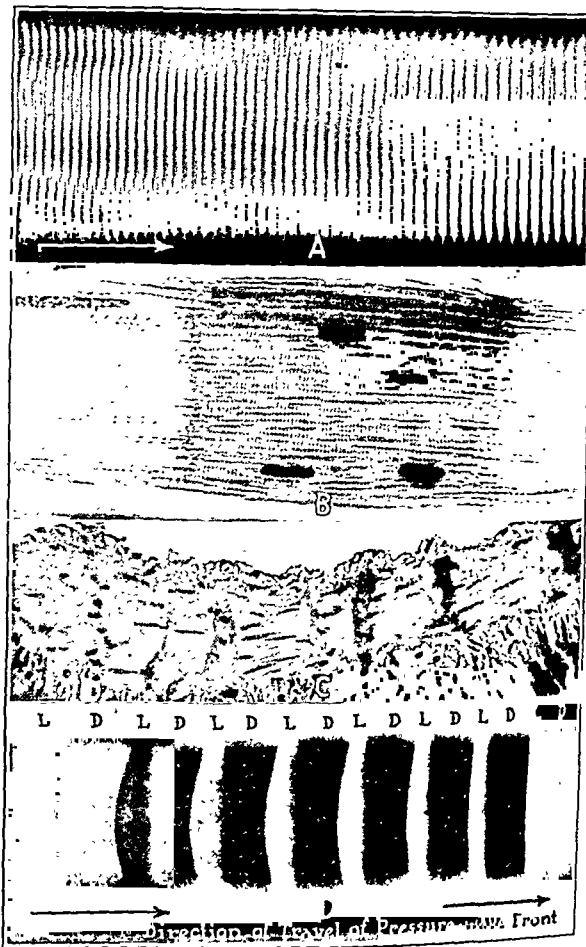


Fig. 2.—*A*, superposed gelatin silver iodide and chloride striae within capillary glass tubule, inside diameter 100 microns; original magnification 260. *B*, strong contraction waves with pressure nodes, fine striae, compressed nuclei; tension internodes, wide striae, long nuclei of rectus abdominis muscle fiber of frog; original magnification 910. *C*, compressed nodal, stretched internodal nuclei, long muscle layer, colon of guinea pig; original magnification 260. *D*, superposed gelatin silver iodide striae within capillary glass tubule, inside diameter 80 microns; original magnification 260.

times in muscle (fig. 2 *B*) of the alphabetical series of alternate dark and light Q, J, Z, J, Q bands. The intermediate Z band is inconstant in striated muscle. It is not a sine qua non of genuine cross striated muscle (compare figs. 1 *C* and 2 *B*). The Z band appears at a certain energetic level of the intrinsic wave mechanics of muscle.

Strong serial contraction compression waves in frog muscle may be generated by sudden direct changes of temperature resulting in alternate nodes and internodes (fig. 2 *B*). The pressure nodes have condensation of cytoplasm, fine closely spaced striae, increased anisotropy and mineral ash content and round compressed nuclei; the tension internodes have rarefied fibrillated cytoplasm, widely spaced striae, decreased anisotropy and mineral ash content and elongated nuclei. Strong serial standing compression waves in the smooth muscle of the intestine (fig. 2 *C*) and pregnant uterus of the living guinea pig are generated by stimulation of the muscle between ligatures placed 1 inch apart. Pressure

nodes and tension internodes in smooth muscle are similar to those in striated muscle as regards mineral content, anisotropy and nuclei. This histologic picture becomes clear when the traveling smooth muscle waves are transformed into those of a standing system by multiple reflections, producing constructive interference between the ligatures.

When a compressional wave front travels in the direction of the arrows (fig. 2 *D*) in a microcapillary glass tubule containing gelatin, sodium iodide and diffusing silver nitrate, there are generated superimposed intense waves. The widely spaced dark bands are generated by the photochemical action of carbon arc light for three seconds (the L's in figure 2 *D*); the finer intermediate striae develop during the two minute interval in the dark (the D's in figure 2 *D*). The progressive increase in the width of the dark bands with their convexities directed toward the left is due to the fact that those on the left are exposed to light over a longer period of time by the summation of the time intervals during exposure to light.

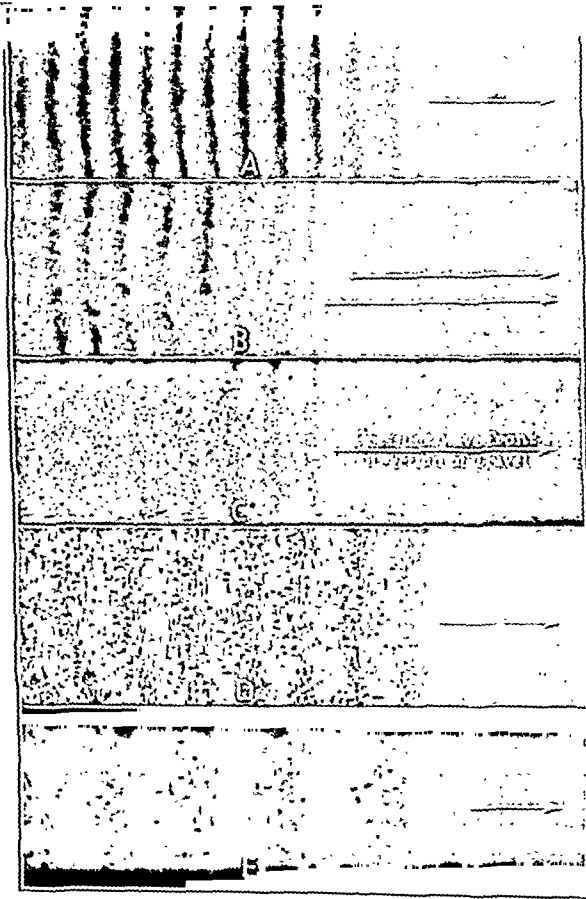


Fig. 3.—Same glass tubule containing gelatin, uric acid and diffusing hydrochloric acid (*A*) near end and (*E*) at middle of tubule. Progressive increase of wavelength with weakening of pressure wave front, identified as a transverse clear advent moving wave; original magnification 260.

The rate of travel of the mildly explosive pressure wave front (fig. 3) and the wavelength of the striae vary by changes of light, temperature, chemical concentration and constitution, colloidal state of the gelatin, length and diameter of the microcapillary glass tubules, and distance from the ends of the glass tubule. The interference pattern of the striae vary as centers of

intense photochemical reactions occur in silver chloride gelatin within the glass tubules which produce biconcave, biconvex or crisscross arrangements (figs. 4 *B* and *C*). These pictures are similar to those of muscle striae underlying motor end plates (figs. 4 *D* and *E*).

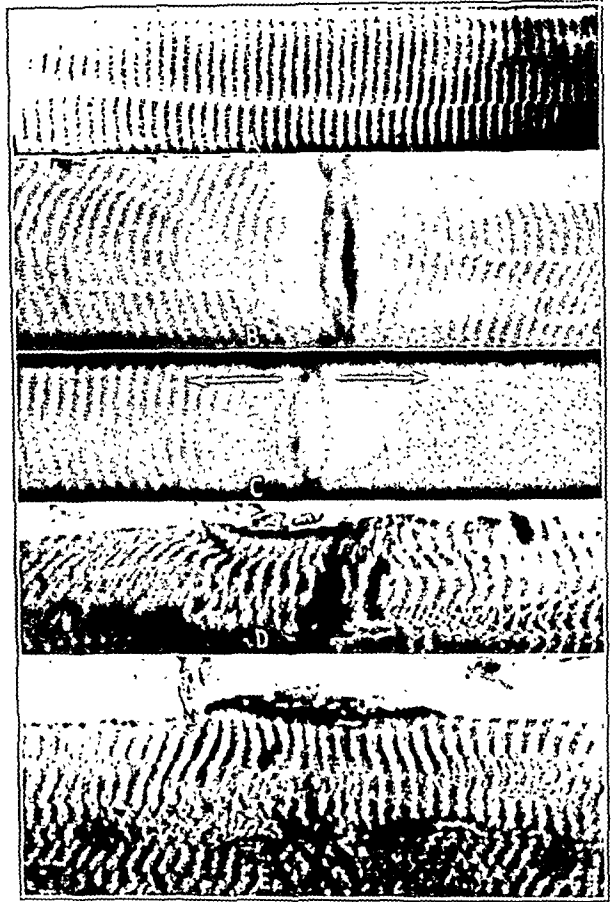


Fig. 4.—Gelatin silver chloride striae; *A*, vernier shift; *B* and *C* (original magnification 200), radiation of striae from center of photochemical change compared with similar radiation of muscle striae under motor end plates, intercostal muscle of white rat, *D* and *E* (original magnification 910), gold chloride technic.

SUMMARY

Microcapillarity confines, stabilizes, orients and concentrates the multiple microcompressional waves of physiochemical changes into alternate zones of condensation and rarefaction, expressed as both Liesegang and muscle striae. Wavelength, spacing of striae and rate of physiochemical change appear to be interrelated. Transformation of chemical into mechanical energy of muscle motion appears to be an algebraic summation of multiple micromechanical compressional waves of mildly explosive pressure, radiated from physiochemical reactions constrained within the microcapillary muscle fiber or fibril.

561 North Fifteenth Street.

The Boy.—Among the golden words of the English language are those in Captain Scott's farewell letter to his wife: "Make the boy interested in natural history if you can; it is better than games; they encourage it at some schools. I know you will keep him in the open air. Above all, he must guard and you must guard him against indolence. Make him a strenuous man." —Harris, H. A.: *The Anatomical and Physiological Basis of Physical Training*, *Brit. M. J.*, Nov. 11, 1939.

Clinical Notes, Suggestions and New Instruments

SULFANILAMIDE CYANOSIS RELIEVED BY NICOTINIC ACID

J. FRANK DOUGHTY, M.D., TRACY, CALIF.

Cyanosis occurring during the administration of sulfanilamide is so common that it is expected, but it has not been considered harmful. However, other symptoms which may be distressing are the frequent headache, weakness and nausea. In my limited experience, these symptoms are rarely present without the appearance of cyanosis.

In June 1939 I was administering sulfanilamide to a patient with facial erysipelas with excellent results in reducing the temperature and activity of the lesions; but severe cyanosis, headache, nausea and vomiting occurred. I recalled having read an abstract of an article reporting the relief of symptoms with sulfanilamide by giving nicotinic acid.¹ Therefore, I administered 20 mg. of nicotinic acid three times a day. The headache and nausea stopped and the cyanosis disappeared. It was possible to continue the sulfanilamide until the erysipelas was cured.

Since that time I have administered nicotinic acid to every patient receiving sulfanilamide who developed cyanosis or any of the other signs of toxicity to that drug. Complete relief of those symptoms usually occurred. These cases have included gonorrhea, streptococcal infection of the throat and of the hands, and one case of streptococcal pneumonia.

This report is made in the hope that it may give a clue to the mechanism of the cyanosis, which some physiologic chemist may discover. Perhaps a trial of the method in a larger series of cases may be of value to many patients having symptoms of toxicity accompanied by cyanosis due to the administration of sulfanilamide.

231 West Eleventh Street.

MODIFIED WESTERGREN SEDIMENTATION TUBE

H. D. FURNISS, M.D., NEW YORK

The sedimentation tube is a modification of the Westergren tube and was designed to improve and facilitate the technic of blood sedimentation.

The tube is 250 mm. long, with an internal diameter of approximately 2.5 mm. It is graduated from zero to 200 mm. and has a capacity in the graduated area of approximately 1 cc.

Two styles are available: one with stopcock permanently attached and the other without stopcock but with a metal plug to seal the top of the tube. A separate stopcock is available for the latter. The upper end of the stopcock has a Luer slip so that any syringe with a Luer tip can be attached. A Luer-Lok syringe is recommended because the tip is much stronger. The smaller the capacity of the syringe, the better the control.

TECHNIC

From 1.5 to 2 cc. of the blood is withdrawn into a test tube containing a suitable anticoagulant solution. Three satisfactory solutions are in common use:

1. A 20 per cent solution of potassium oxalate, one drop of this being used for each cubic centimeter of blood.
2. Heparin, containing 15 cat units per milligram, one drop being used for each cubic centimeter of blood.
3. Citrate, 0.25 cc. of a 3.8 per cent solution, added to 2.25 cc. of blood.

1. McGinty, A. P.; Lewis, G. T., and Holtzelaw, M. R.: Symptoms Occurring with Sulfanilamide Relieved by Nicotinic Acid, *Georgia M. A. J.* 28: 54 (Feb.) 1939; abstr. *J. A. M. A.* 112: 1996 (May 13) 1939.

These tubes are manufactured by Becton, Dickinson & Co., Rutherford, N. J.

Blood is added to the preferred solution and the contents of the test tube are agitated gently until thoroughly mixed.

With the stopcock open and the syringe attached and in the closed position, the lower end of the tube is immersed in

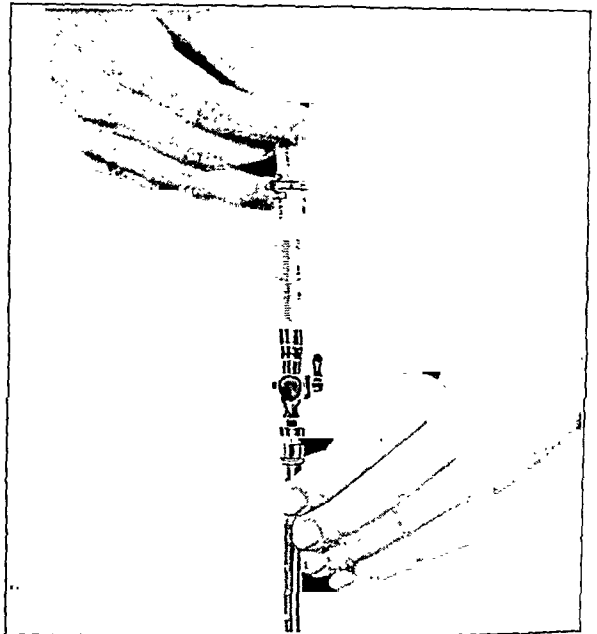


Fig. 1.—Showing blood being drawn into the tube. When proper level is attained the stopcock is closed and the syringe removed.

the solution and the liquid aspirated to the zero mark. The stopcock is closed and the syringe detached.

The tube is then hung on the metal rack, which has previously been attached in a suitable place. The metal collar on the top of the tube is slotted to permit the tube to hang vertically and also prevents the tube from slipping down.

When the type with the detachable stopcock is being used, and in the event that it is desirable to use more than one tube, the bottom of the tube can be momentarily closed with the tip of the finger while the stopcock is being detached and the special metal plug, slightly moistened, is inserted in its place. If this method is used, it is suggested that the fluid level in the tube be raised slightly to compensate for the amount displaced when the metal plug is inserted into the top fitting of the tube. The finger may then be removed and the tube hung on the rack.

The glass tube can be sterilized by boiling or by the use of alcohol or the like. To avoid removing the lubricant, neither alcohol nor any grease solvent should come in contact with the stopcock.

54 East Sixty-Second Street.

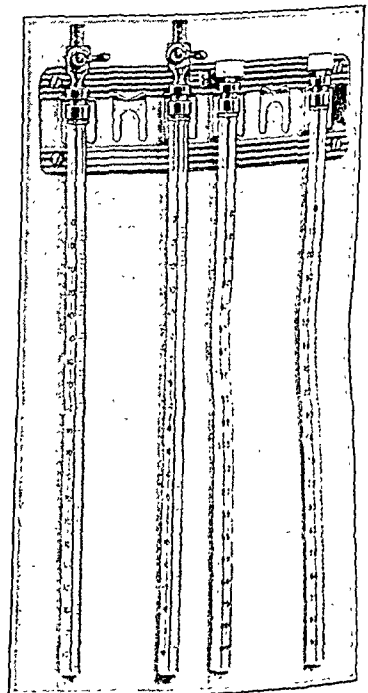


Fig. 2.—Tubes on the left have integrally attached stopcocks. The ones on the right are stopped with a smoothly fitting plug that prevents leakage.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

THE THERAPY OF DROPSY

H. M. MARVIN, M.D.

NEW HAVEN, CONN.

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Dropsy, or edema, is usually defined as the accumulation of serous fluid in the intercellular spaces of the subcutaneous or deeper tissues and in the serous cavities. The source of this fluid is the blood, from which it has escaped by passage through the walls of the blood vessels. Edema is always but one manifestation—although sometimes the most dramatic and important—of some abnormality or disease process, and its removal by medical means should logically begin with treatment of the causative process. Specific measures for its removal are necessary only if its location or extent render it harmful or uncomfortable to the patient and should ordinarily be employed only after correction or treatment of the underlying abnormality.

There are many conditions with which edema may be associated, but only a few of these will be considered in this review, which is concerned primarily with the practical aspects of medical treatment. The conditions to which attention will be devoted comprise congestive heart failure, acute and chronic nephritis, cirrhosis of the liver, the Pick syndrome of constrictive pericarditis, vitamin deficiency and marked lowering of the protein content of the blood plasma, whether this is found in malnutrition, in chronic glomerulonephritis or in so-called lipid nephrosis.

For a clearer understanding of the discussion that follows, it is desirable to review briefly the mechanisms involved in the formation of edema. The opinion first expressed clearly by Starling¹ in 1896 has received the almost unanimous support of investigators in recent years; in its simplest form it may be stated as follows: The capillary wall is a membrane freely permeable to water and to most of the crystalloids of the blood, such as salt, sugar and urea, which pass from the capillary into the surrounding tissue spaces, or from these spaces into the capillary, in response to physical laws now well understood. The most important factor causing movement of fluid out of the capillary is the pressure exerted on it; in other words, the intracapillary blood pressure. If this were unopposed, most of the fluid of the blood would readily pass into the tissue spaces. But it is opposed, as Starling first showed, by a force due to the presence of proteins, chiefly albumin, in the blood plasma. These protein substances cannot pass readily through the capillary wall; by remaining within the lumen they attract fluid powerfully through the process of osmosis, the force so exerted being known as the colloid osmotic pressure of the plasma. Obviously

the direction and extent of movement of fluid through the capillary wall must depend on the balance of these two opposed forces; if the intracapillary pressure is higher than the colloid osmotic pressure, fluid will pass out of the blood stream and edema will form. On the contrary, a rise in the colloid osmotic pressure above the capillary blood pressure will result in prompt withdrawal of fluid from the tissue spaces into the blood.

It is thought that both these processes are operating continuously in health and in disease. It is impossible to assign any constant value for the capillary blood pressure, since this varies in different parts of the body and in response to many influences, but in the capillaries at the base of the finger nail Landis² has found that the pressure at the arterial end of the loop averages about 43.5 cm. of water, while the colloid osmotic pressure is about 34 cm. of water. The result of this difference is to force fluid from the capillary. But when the blood reaches the venous end of the loop the pressure has fallen to an average value of 16.8 cm., while the colloid osmotic pressure has risen because of increased concentration due to loss of water. At the venous end of the capillary, then, fluid will be drawn from the tissue spaces into the blood. It is therefore clear that edema may result from either or both of two changes: an increase in the capillary pressure or a decrease in the amount of protein in the blood plasma.

This statement has been purposely simplified and abbreviated but is essentially correct. The mechanism that it describes is not the only one concerned in the formation of edema but is generally regarded as the most important. The other primary and contributory factors have been lucidly reviewed by Landis,³ whose studies of the capillary circulation have added greatly to our knowledge. He regards as other primary factors injury to the capillary wall, which increases its permeability and obstruction to lymph channels. As contributory factors he mentions low tissue pressure, high salt intake, high fluid intake, a warm environment and disturbances of innervation. It is well to emphasize that the contributory factors may become of great importance and may actually determine the occurrence or disappearance of edema.

Thus in the capillary bed there are two important and opposed physiologic processes involved in the formation of edema; similarly in the kidney there are two fundamental and opposed processes involved in the formation of urine. It is now believed that the renal glomerulus acts essentially as a filter; relatively enormous quantities of a protein-free ultrafiltrate normally pass through it into the tubules, where most of it is reabsorbed, leaving only a small percentage to be excreted as urine. It is apparent that the volume of urine may be increased by either or both of two processes: an increase in glomerular filtration or a decrease in tubular reabsorption.

With this brief outline of the more important mechanisms in mind, we may consider the treatment of edema associated with various clinical conditions.

CONGESTIVE HEART FAILURE

Congestive heart failure is the most frequent cause of edema sufficient to require treatment; fortunately it is also the condition in which specific treatment is most gratifying. The edema is thought to be due to several

From the Department of Internal Medicine, Yale University School of Medicine, and the New Haven Hospital.

1. Starling, E. H.: On the Absorption of Fluids from the Connective Tissue Spaces, *J. Physiol.* 19: 312, 1895-1896.

2. Landis, E. M.: Micro-Injection Studies of Capillary Blood Pressure in Human Skin, *Heart* 15: 209 (May) 1930; Capillary Pressure and Capillary Permeability, *Physiol. Rev.* 14: 404 (July) 1934.

3. Landis, E. M.: The Passage of Fluid Through the Capillary Wall, *Am. J. M. Sc.* 193: 297 (March) 1937.

factors, which probably vary in relative importance in different cases. The effective filtration pressure in the capillaries is increased by the rise in general venous pressure that occurs in congestive heart failure and also by the muscular inactivity that generally accompanies it.⁴ In addition there is increased permeability of the capillaries to water and crystalloids, and in some cases there is a fall in the effective colloid osmotic pressure of the plasma because some protein passes into the tissue spaces. The hypoproteinemia is probably increased at times by the loss of albumin in the urine and by the low protein diet often prescribed by the physician.

A detailed discussion of the treatment of congestive heart failure is beyond the scope of this article, but it is now generally agreed that this should include complete rest in bed, necessary sedatives, limitation of fluid and of salt intake, and full digitalization. These measures should precede the use of diuretics in most instances, since they will often result in marked diuresis and render further treatment unnecessary. But there are several important exceptions to this statement. If there is considerable fluid in one or both pleural cavities it should be withdrawn at once by means of paracentesis, for such fluid often causes great respiratory discomfort and is but slowly absorbed and excreted, even when diuretics are employed. Furthermore, if the edema elsewhere is so extreme as to be the cause of danger or grave discomfort, the mercurial diuretics should be administered at once, without waiting for the effect of digitalis. I am in agreement with Thomson⁵ that the diuretic effect of these agents is often just as great without digitalis as with it, and the patient may be spared some days of discomfort if they are used immediately.

Xanthines.—Until about fifteen years ago the xanthine diuretics, sometimes known as the purine bases, were the only ones in general use. For practical clinical purposes this group may be regarded as consisting of theophylline and theobromine with their derivatives; caffeine is also a member but has little or no value as a diuretic in disease states. Theophylline may be administered in gelatin capsules containing from 3 to 5 grains (0.2 to 0.325 Gm.) and may be given two or three times a day. Even in this small dosage, however, it often causes nausea and vomiting after four or five doses have been given and must then be discontinued. Because of the likelihood of vomiting, it is usually wise to give theophylline for periods of only a few days at a time, even if it is well tolerated; there is some evidence that the total diuretic effect is greater with intermittent than with continuous administration. It is the most potent of the xanthine diuretics but can seldom be given in effective dosage because of its unfortunate side actions. In recent years it has been used far more frequently in combination with other salts, the best known preparations being theophylline with sodium acetate and theophylline with ethylenediamine (aminophylline). These are usually tolerated better than is theophylline alone and can therefore be used for longer periods, but it is well to omit them for a few days after a period of brisk diuresis. Theophylline with sodium acetate is available in tablets containing from 2½ to 7½ grains (0.16 to 0.5 Gm.); those which have an enteric coating are better tolerated by most patients. The therapeutic dose should be deter-

mined in each case by actual trial, starting with small amounts in order to avoid the induction of vomiting. Total daily quantities of from 15 to 30 grains (1 to 2 Gm.) can be taken by many subjects without discomfort if given in three or four doses, but amounts less than this often cause satisfactory diuresis. The other preparation, theophylline with ethylene diamine, is better known today because of its widespread use in recent years for its supposed effect on the coronary arteries. It is not a potent diuretic but may be of value in preventing the reaccumulation of edema that has been successfully removed by other agents. It is marketed in tablets containing 1½ grains (0.1 Gm.), and six or eight of these a day are required in most cases for any significant diuretic effect. Like other theophylline preparations, this also may cause nausea if given in doses sufficiently large to increase the volume of urine.

The Council on Pharmacy and Chemistry makes the following statement concerning the actions and uses of xanthine derivatives:

Actions and Uses.—The Council recognizes no therapeutic claim for any xanthine derivative beyond those for diuretic action and for use as a myocardial stimulant. Theobromine and theophylline surpass caffeine in their diuretic, and perhaps in cardiac and muscular, actions. They are therefore generally preferred in cardiac edemas, etc., since they are equally, or more, effective, more prompt and largely avoid the unpleasant side effects (insomnia, nervousness, gastric disturbance) which often interfere with the use of caffeine in adequate doses. This freedom from side effects holds true, particularly for theobromine. Theophylline surpasses theobromine in diuretic efficacy, but its action is probably not so lasting; it may produce gastric disturbances; renal irritation has been reported. Theobromine is therefore generally preferred, sometimes preceded for a few days by theophylline. If central stimulation is desired, caffeine must be used.

It has been the experience of almost all observers that theobromine and its compounds are less powerful diuretics than the closely related substances just named, but they are often well tolerated in effective dosage and may therefore prove to be far more satisfactory. Theobromine may be administered in capsules in doses of 5 or 10 grains (0.325 or 0.650 Gm.) three times a day and continued for a number of days if nausea does not occur. One of its best known compounds is theobromine with sodium salicylate, which contains approximately 50 per cent theobromine. This is one of the mildest of all diuretics, seldom causes nausea or vomiting and must be given in doses of from 40 to 60 grains (2.6 to 4 Gm.) or more a day. Another preparation is theobromine calcium salicylate, or theocalcin, which is said to contain 48 per cent theobromine, 11 per cent calcium and 38 per cent salicylic acid. Stewart's⁶ study indicated its advantages, and these have been confirmed by subsequent experience. It is a potent diuretic, often superior to theophylline in this respect, seldom causes nausea and may be continued without intermission as long as diuresis results. It is available in tablets containing 7½ grains (0.5 Gm.), and the usual effective dose is from three to six tablets a day; larger amounts may be given if necessary.

It is the belief of many students that the xanthines cause diuresis by an action on the renal glomerulus, increasing the filtration, but authoritative opinion is not agreed on this. Smith⁷ states that, although they increase the filtration rate, this is not an essential factor

4. Smirk, F. H.: Observations on the Causes of Edema in Congestive Heart Failure, *Clin. Sc.* 2: 317 (Dec.) 1936.

5. Thomson, W. A. R.: The Organic Mercurial Diuretics in the Treatment of Cardiac Edema, *Quart. J. Med.* 6: 321 (July) 1937.

6. Stewart, H. J.: The Use of Theocalcin in the Treatment of Heart Failure of the Congestive Type, *J. Clin. Investigation* 8: 387 (April) 1930.

7. Smith, H. W.: The Physiology of the Kidney, New York, Oxford University Press, 1937, p. 238.

in their diuretic action, which is to be attributed to diminished reabsorption of water in the tubules. A final statement on this point is not possible as yet. The xanthines as a group are far from negligible; in recent years they have been overshadowed and to a large extent superseded by the mercurials, but they have an important place in the treatment of patients with slight or moderate edema and of those patients who object seriously to intravenous injections.

Organic Mercurials.—The mercurial diuretics are unquestionably the most effective available today, even though an occasional patient may exhibit a greater response to one of the xanthines. Merbaphen, the first to be introduced, has been almost completely displaced in recent years by salyrgan, which is regarded as more potent and less toxic. These are organic mercurial compounds containing about 10 per cent of mercury and are effective when administered by intravenous or intramuscular injection or in the form of rectal suppositories. Their effectiveness is greatly increased if acid-producing salts are administered by mouth for several days preceding the injection, and this preliminary medication should be a routine unless the need for the first injection is urgent. Ammonium chloride and ammonium nitrate are the salts most commonly used, but calcium chloride and calcium nitrate are also effective. It has been shown⁸ that there is a true synergism between these salts and the mercurial preparation; all four regularly cause a lowering of the carbon dioxide combining power of the plasma and increase the diuretic response. Alkalinizing salts cause a rise in the carbon dioxide combining power and a decrease in the diuretic effect, while neutral salts cause no change in either function. The statement is often made that doses of these acid-producing salts as large as from 90 to 120 grains (6 to 8 Gm.) a day must be given in order to secure satisfactory results, but my experience is in accord with that of Thomson,⁹ who has found doses of from 60 to 90 grains (4 to 6 Gm.) quite sufficient. Even these smaller doses will almost invariably cause nausea and vomiting unless administered in the form of enteric coated tablets, which are taken by most patients without discomfort in the doses mentioned.

The mercurials for injection are available in ampules containing 1 and 2 cc. It is customary to give only from 0.5 to 0.75 cc. at the first injection, in case there should be an idiosyncrasy to mercury or some untoward reaction, both of which are rare. Subsequent doses are usually 2 cc. If the patient requires a series of injections it is satisfactory to continue ammonium chloride without interruption and inject the mercurial every third, fourth or fifth day. The results are almost always satisfactory and sometimes astonishing; it is not unusual to secure a urinary secretion of from 6 to 10 liters in twenty-four hours, and quantities as large as 15 or 16 liters have been recorded.

A few years ago Shelling and Tarr⁹ reported that the diuretic effect of salyrgan might be increased by combining magnesium sulfate with it. They recommended the use of 15 cc. of 50 per cent magnesium sulfate with 2 cc. of salyrgan and 1.5 cc. of 5 per cent procaine hydrochloride, the whole to be mixed thoroughly in a 20 cc. syringe and injected deeply into the

gluteal muscles. There can be no question that this combination is sometimes remarkably efficacious with patients who have shown little or no response to salyrgan alone. To secure such effects, however, it is not always necessary to use such large quantities of magnesium sulfate; a mixture of 2 cc. of salyrgan, 6 or 8 cc. of 50 per cent magnesium sulfate and 2 cc. of 1 per cent procaine hydrochloride solution has often given excellent results. This is about half the total quantity recommended by Shelling and Tarr, and its injection into the muscles seldom causes pain at the time or later. It should be added that the anterior muscles of the thighs are more suitable for such injections than are the gluteal muscles if the patient is confined to bed.

It is generally agreed that the mercurial diuretics owe their effect largely, if not exclusively, to a direct action on the renal tubules, diminishing their power of reabsorption.

Since there was a widespread belief that the xanthines caused diuresis chiefly by increasing glomerular filtration and the mercurials by diminishing tubular reabsorption, it was but natural that attempts should be made to secure a more effective diuretic agent by combining the two substances. In Europe such a combination was introduced as early as 1929; several years later it appeared in this country under the name mercupurin. According to the revised supplement to New and Non-official Remedies 1939, it contains 10 per cent of the mercurial component and 4.86 per cent of anhydrous theophylline; each cubic centimeter contains about 39 mg. of mercury in nonionizable form. DeGraff and his collaborators¹⁰ in a series of important studies have shown that the addition of theophylline to a mercurial diuretic causes much more rapid absorption from the site of intramuscular injection and also renders it far less injurious to the tissues. Comparative clinical studies have shown that the combination of the two substances is a more potent diuretic than is the mercurial alone, and this increased potency is apparently due entirely to the addition of theophylline. The advantages of combining the two have been so apparent in recent years that practically all mercurials now marketed in Europe have been modified by the addition of 5 per cent theophylline. Several years ago salyrgan was thus modified and is available under the name salyrgan-theophylline; apparently its content of mercury and of theophylline is approximately the same as that of mercupurin. More recently there has been introduced a combination of the two under the name esidrone, which is said to contain 31.2 per cent mercury in nonionizable form and 28 per cent theophylline, which is chemically connected with the mercury molecule. The reports on its clinical use thus far available¹¹

10. DeGraff, A. C., and Batterman, R. C.: Reaction at Site of Injection of Mercurial Diuretics as Influenced by Theophylline, *Proc. Soc. Exper. Biol. & Med.* 32:1546 (June) 1935. DeGraff, A. C.; Nadler, J. E., and Batterman, R. C.: A Study of the Diuretic Effect of Mercupurin in Man, *Am. J. M. Sc.* 191:526 (April) 1936. DeGraff, A. C.; Batterman, R. C., and Lehman, R. A.: The Influence of Theophylline upon the Absorption of Mercupurin and Salyrgan from the Site of Intramuscular Injection, *J. Pharmacol. & Exper. Therap.* 62:26 (Jan.) 1938. Lehman, R. A., and Dater, Arnold: Further Studies on the Absorption of Mercurial Diuretics as Influenced by Theophylline and Other Substances, *ibid.* 63:443 (Aug.) 1938. DeGraff, A. C.; Batterman, R. C.; Lehman, R. A., and Yasuna, E.: Excretion of Mercury Following Administration of Mercurial Diuretics With and Without Theophylline, *Proc. Soc. Exper. Biol. & Med.* 29:250 (Nov.) 1938.

11. Uhlmann, F.: Ueber ein neues Diureticum, *Esidron*, *Klin. Wchnschr.* 17:352 (March 5) 1938. Hestermann, Max, and Panizzon, Leandro: Zur Kenntnis der Wirkung von Esidron und über Esidron, ein neues Diureticum, *Arch. f. exper. Med.* 188:554, 1938. Schneiderhaur, A.: Ueber Quecksilber-Diurese mit Esidron "Ciba," *München. med. Wchnschr.* 85:1783 (Nov. 18) 1938. Volini, J. F., and Levitt, R. O.: Studies on Mercurial Diuretics—Esidrone, a New Mercurial Diuretic, *Illinois M. J.* 74:355 (Oct.) 1938.

8. Ethridge, C. R.; Myers, D. W., and Fulton, M. N.: Modifying Effect of Various Inorganic Salts on the Diuretic Action of Salyrgan, *Arch. Int. Med.* 57:714 (April) 1936.

9. Shelling, D. H., and Tarr, Leonard: The Combined Use of Magnesium Sulfate and Salyrgan as a Diuretic in Cardiac Edema, *M. J. & Rec.* 131:365 (April 2) 1930.

are not sufficient to determine whether the great increase in the amount of theophylline in the mixture has caused any considerable increase in its diuretic potency. [The product has not been accepted by the Council on Pharmacy and Chemistry.—ED.]

There can be no question that the combination of a mercurial with theophylline is the most powerful diuretic agent now available for most patients with congestive heart failure.

Both salyrgan and the mercurial component of mercupurin are available in the form of rectal suppositories, each containing approximately 0.5 Gm. of mercury and a small amount of local anesthetic to prevent rectal irritation. A cleansing enema usually precedes the insertion of the suppository, and the diuretic response is often increased by the preceding administration of the acid-producing salts. Some observers have found the suppositories to be almost as effective as intravenous or intramuscular injections of the mercurials, but most regard them as about one third to one half as effective. (It should be noted that the suppositories of salyrgan have recently been found to result in rectal irritation or ulceration in so many cases that their acceptance has been rescinded by the Council on Pharmacy and Chemistry, and many clinicians have discontinued their use.¹²) Similar unfortunate results have apparently not followed the use of mercurin suppositories, but any such preparation should be used with great caution and should be discontinued immediately on the appearance of signs of local irritation.

There is general agreement that the mercurials should not be used in the presence of acute nephritis or ulcerative colitis. For some years fear was expressed that they might cause serious injury to the renal tubules, and a few such instances have in fact been reported. But the accumulated experience of the past ten years justifies the statement that the mercurial diuretics, especially those combined with theophylline, are safe and highly effective and often retain their full potency after hundreds of injections over a period of many months or years. In the great majority of cases, even of chronic nephritis, there is no evidence that the kidneys have been injured by the mercury.

Potassium Salts.—According to Keith and Binger,¹³ potassium salts were recommended for the treatment of dropsy as early as 1679. In recent years most of the studies relating to their diuretic action have been concerned with nephritic patients, but in 1932 Barker¹⁴ reported excellent results from the administration of potassium chloride to a group of patients whose edema was due to congestive heart failure. He emphasized the importance of placing such patients on a full general diet with an excess of acid ash in which a low ratio of sodium to potassium is maintained. The dose of potassium chloride found to be effective in most of his cases was 5 Gm. (75 grains) a day; this amount was given to the patient each morning in a salt shaker and sprinkled on the food instead of sodium chloride. At the end of the day any salt remaining was dissolved in water and taken by mouth. Twelve of his sixteen patients obtained excellent results, and he observed, as others had done, that no ill effects followed even if very large doses were given for long periods.

In a later and more elaborate study, Keith and Binger¹⁵ found that potassium salts gave "very satisfactory diuretic results" in 48 per cent of their sixty cases and fair results in another 33 per cent, but their figures do not indicate in how many of these edema was due to heart failure. After a careful study of five potassium salts they concluded that the nitrate was preferable, since it frequently caused diuresis and seldom gave rise to untoward effects. They pointed out that any potassium salt must be given in large doses, amounting to 12.5 Gm. or more of the nitrate a day, but state that smaller doses should be administered first. One of their patients took 24.5 Gm. of potassium salts daily for thirteen days and 871 Gm. in sixty-eight days without complaints or toxic symptoms! The salts may be administered in powder form or in solution, but the most satisfactory method is by means of enteric coated tablets containing $7\frac{1}{2}$ grains (0.5 Gm.) each. Like ammonium chloride and ammonium nitrate, the potassium salts may be used in conjunction with other diuretics to enhance the action of the latter.

A great many studies are in complete harmony in indicating that in the experimental animal, in normal human subjects and in patients with edema due to several different causes the replacement of sodium by potassium results in increased excretion of water, while the substitution of sodium for potassium results in increased retention of water. The exact mechanism responsible for these results, however, is not entirely clear. It is known that potassium is quickly absorbed from the intestine and is promptly excreted by the kidney, which is able to concentrate it as much as fifty times; even after large doses the amount in the blood is seldom elevated appreciably and often not at all. In fact the careful measurements of Barker¹⁴ revealed practically no changes in the sodium, potassium, calcium, carbon dioxide combining power, p_{H} , or cholesterol of the blood during the administration of potassium. In some cases it seems possible that the diuresis is linked with a shift in the acid-base equilibrium, but this cannot be demonstrated regularly.

Bismuth.—Ten years ago, Mehrtens and Hanzlik¹⁵ brought forward evidence indicating that certain bismuth preparations injected intramuscularly in small doses act as a diuretic and are almost devoid of toxic manifestations. In the following year Hanzlik and his co-workers¹⁶ cited case reports indicating that bismuth sodium tartrate injected in doses of one half grain (0.03 Gm.) often caused prompt diuresis which was maintained for from four to eighteen days, the average being six days. It was particularly satisfactory in cases of edema due to heart failure, and in the cases cited it was far more effective than merbaphen or theophylline with sodium acetate. Several years later Stockton¹⁷ reported the results of intramuscular injections of bismuth sodium tartrate in thirteen cases of edema in which there had been no response to treatment with digitalis and the xanthine and mercurial diuretics. Congestive heart failure was present in nine of these. Bismuth sodium tartrate caused marked diuresis in ten cases and moderate diuresis in one; four showed no diuretic response either to this or to other agents. The average duration of diuresis after the injection of a bismuth preparation was four days.

12. DeGraff, A. C.; Cowett, M., and Batterman, R. C.: Rectal Irritation Following the Use of Mercurial Diuretics in Suppository Form. *J. A. M. A.* **113**:214, (July 15) 1939. Salyrgan Suppositories and Mercurin: A Warning, Report of the Council on Pharmacy and Chemistry, *J. A. M. A.* **113**:213 (July 15) 1939.
13. Keith, N. M., and Binger, M. W.: Diuretic Action of Potassium Salts. *J. A. M. A.* **105**:1584 (Nov. 16) 1935.
14. Barker, M. H.: Edema as Influenced by a Low Ratio of Sodium to Potassium Intake. *J. A. M. A.* **98**:2193 (June 18) 1932.

15. Mehrtens, H. G., and Hanzlik, P. J.: Bismuth as a Diuretic. *J. A. M. A.* **91**:223 (July 28) 1928.
16. Hanzlik, P. J.; Bloomfield, A. L.; Stockton, A. B., and Wood, D. A.: Diuresis from Water Soluble Bismuth. *J. A. M. A.* **92**:1413 (April 27) 1929.
17. Stockton, A. B.: Bismuth Diuresis and the Blood and Urinary Changes Under Clinical Conditions. *Arch. Int. Med.* **50**:142 (June) 1932.

These reports are so encouraging that it is surprising not to encounter further reports in recent medical literature. Untoward actions or toxic effects cannot explain this apparent neglect, for these are absent or negligible; in fact, Hanzlik¹⁸ states that the group of observers at Stanford University has used bismuth preparations in various ways in several thousand cases and in animals in the past twelve years without serious disturbances, injuries or fatalities. It seems probable that this drug, like others of undoubted merit, has failed to come into general use because the mercurial diuretics are usually more potent, even though their action is less sustained than that of bismuth.

According to Stockton,¹⁹ bismuth sodium tartrate probably causes diuresis by general tissue action, resulting in mobilization of chlorides and water. He explains the effect of the mercurial diuretics and of theophylline in the same way, whereas most students today believe that these substances act directly on the kidney. A belief in general tissue action of diuretics was widespread ten years ago but has been largely abandoned in the light of recent studies.

Urea.—Although urea has been recommended as a diuretic in renal disease for a long time, its use for the treatment of cardiac edema seems to date from the report of Crawford and McIntosh²⁰ in 1923. They found it to be of great value in seven of eight cases in which edema was due to heart failure and recommended it both for the removal of edema and to prevent its recurrence. No toxic effects were observed. In 1932 Miller and Feldman²¹ emphasized several of the cardinal virtues of this substance, demonstrating that its diuretic potency does not diminish during months or years of practically uninterrupted use, that there are no demonstrable deleterious effects on the kidneys or other tissues and that it acts, alone or in conjunction with other agents, as an admirable prophylactic to prevent the recurrence of edema.

Large doses are required, varying from 15 to 60 Gm. or more (225 to 900 grains) a day. It is administered most satisfactorily in ice cold aqueous solution three times a day immediately after meals. Its unpleasant taste, which is practically its only disadvantage, can be mitigated for some patients by dissolving it in syrups or fruit juices. Syrup of acacia has been especially recommended as a vehicle for urea, its colloidal nature serving to mask the urea quite satisfactorily. Urea is rapidly absorbed from the intestine and is practically devoid of action in the tissues, even in large doses. After it has been taken for a few days the blood nitrogen should be determined to ascertain whether it is being properly excreted. In almost all instances of congestive heart failure, and even of nephritis and nephrosis, it is readily excreted and carries with it large quantities of water. This mechanical diuretic action is thought to be enhanced by decreased reabsorption in the renal tubules.

Urea is an extremely valuable diuretic and deserves wider popularity than it seems to enjoy at present. All available clinical reports emphasize its complete freedom from untoward actions and its extraordinary constancy of diuretic effect. While it is usually less dramatic in its immediate results than are the mercurials, it has obvious advantages and may be used to

supplement the latter. There are but few patients who cannot take it for at least several weeks at a time, and many continue it for months or years without interruption.

NEPHROSIS

Despite the enormous literature devoted to the subject of nephrosis in the past thirty-five years, there is not yet complete agreement among authoritative observers as to the existence of "pure" or "lipoid" nephrosis as a separate disease entity. There is, however, general agreement that the combination of low serum proteins, profuse albuminuria, normal blood nitrogen and edema may properly be known as the "nephrotic syndrome" and that its treatment is the same whether it is regarded as resulting from a specific renal lesion, a nonspecific renal lesion (one stage in the development of chronic glomerulonephritis) or a general metabolic disease. The edema is thought to be due in large measure, as Epstein²² first pointed out, to the marked hypoproteinemia, which results in great lowering of the colloid osmotic pressure of the blood.

The general principles of treatment include maintenance of the nutrition at the highest possible level by an adequate diet high in protein, limitation of salt and fluid intake and exercise in moderation as long as the clinical state permits. Practically all known diuretics have been tried in this condition; any of them may give satisfactory results in a given case but most of them prove quite ineffective. Thyroid has been extensively used because of the low basal rate in most patients but is seldom effective in causing diuresis, possibly because the low metabolic rate is caused in most instances by the undernutrition rather than by thyroid deficiency. The xanthine diuretics have proved useless in the hands of most observers. Encouraging results have sometimes been obtained from the use of potassium salts, as already outlined. Urea also has occasionally been effective in doses of from 15 to 50 Gm. or more a day and deserves a trial if it is tolerated. But there can be little question that the mercurial diuretics are much the most effective in the majority of cases, and they may be used without fear of increasing the renal lesion. They should be preceded by one of the acid-producing salts. In many cases the mercurials also are useless.

Because of the belief that the edema is due largely or wholly to the reduction of serum proteins, many attempts have been made to raise these to normal levels by means of diets high in protein and by the intravenous injection of such substances as whole blood, blood plasma and solutions of acacia. Leiter²³ has stated that this form of treatment, however plausible it may seem, is inevitably doomed to failure because the amount of material injected cannot be sufficient to cause an appreciable increase in the colloid osmotic pressure of the plasma and because it will be rapidly excreted from the circulation, since the glomeruli are much more permeable to colloids than normally. However, Hartmann and his collaborators,²⁴ Lepore,²⁵ Landis²⁶ and Shelburne²⁷ have all reported excellent results from the repeated and cautious intravenous injection of acacia solutions. The strength of the solutions has usually

22. Epstein, A. A.: Concerning the Causation of Edema in Chronic Parenchymatous Nephritis: Method for Its Alleviation, *Am. J. M. Sc.* **154**: 638 (Nov.) 1917.

23. Leiter, Louis: Nephrosis, *Medicine* **10**: 135 (May) 1931.

24. Hartmann, A. F.; Senn, M. J. E.; Nelson, Martha V., and Perley, Anne M.: The Use of Acacia in the Treatment of Edema, *J. A. M. A.* **100**: 251 (Jan. 28) 1933.

25. Lepore, M. J.: Acacia Therapy in Nephrotic Edema, *Ann. Int. Med.* **11**: 285 (Aug.) 1937.

26. Landis, E. M.: Observations on Acacia Therapy in Nephrosis, *J. A. M. A.* **109**: 2030 (Dec. 18) 1937.

27. Shelburne, S. A.: Rational Use of Acacia in Treatment of the Nephrotic Syndrome, *J. A. M. A.* **110**: 1173 (April 9) 1938.

18. Hanzlik, P. J.: Personal communication to the author, April 1938.

19. Stockton, A. B.: Actions of Diuretic Drugs and Changes in Metabolites in Edematous Patients, *Arch. Int. Med.* **58**: 891 (Nov.) 1936; footnote 17.

20. Crawford, J. H., and McIntosh, J. F.: The Use of Urea as a Diuretic in Advanced Heart Failure, *Arch. Int. Med.* **36**: 530 (Oct.) 1923.

21. Miller, H. R., and Feldman, A.: Prolonged Use of Massive Doses of Urea in Cardiac Dropsy, *Arch. Int. Med.* **49**: 964 (June) 1932.

been from 6 to 15 per cent, in water or in physiologic solution of sodium chloride, and the injections may be given daily or at intervals of from two to four days. In practically all reported cases of benefit from acacia many diuretics had been tried without success. Following the disappearance of edema, a diet high in protein should be continued; Shelburne regards this as an essential part of the treatment.

The administration of acacia is not wholly without disadvantages, and some²⁸ have stated that these are so serious as to make the use of the substance unjustified. The work of Dick²⁸ is often quoted in support of this belief, but Shelburne²⁷ has recently pointed out that this work is open to serious criticism and should not prevent the proper use of a valuable therapeutic agent. Immediate reactions to injections of acacia are infrequent if the solutions are freshly and carefully prepared, but serious reactions have followed the use of impure solutions. It seems clear that if acacia is to be used it should be in a hospital rather than in the patient's home. If other methods of treatment have been tried without success and the removal of edema is highly desirable, recent experience would certainly justify the trial of acacia. If this also proves ineffective, other diuretics should be employed immediately after the acacia, as they may then prove beneficial.²⁶

VITAMIN DEFICIENCY

In the past several years evidence has been presented, chiefly by Weiss and his collaborators,²⁹ indicating that deficiency of vitamins, especially of vitamin B₁, may lead to various types of cardiovascular dysfunction, whether the heart was previously normal or diseased. The cardiovascular manifestations do not form a fixed clinical syndrome but may include the characteristic signs of congestive heart failure with marked edema. The diagnosis of the condition may be very difficult, but the possibility of vitamin deficiency should be seriously considered when any patient with an abnormal nutritional history develops the syndrome of heart failure with edema in the absence of convincing signs of heart disease. The presence of other signs of vitamin B₁ deficiency, especially polyneuritis, glossitis and cutaneous changes suggestive of pellagra, may give an important clue. According to Strauss³⁰ "it is rare to observe 'beriberi heart' without at least minimal signs of polyneuritis." Both Weiss and Strauss emphasize the possible importance of measurements of the circulatory velocity and the minute volume output of the heart, as these are increased in the condition now under discussion and are conspicuously slowed in heart failure due to other causes. The response to specific therapy, however, may provide the first and most convincing evidence of the nature of the condition.

General, or nonspecific, treatment consists of the application of the measures enumerated previously: rest in bed, limitation of fluids and of salt and the administration of digitalis and diuretics. Some patients respond well to such a regimen, while others show little or no improvement; indeed, some of Weiss's patients became worse when placed at rest. Specific treatment consists of the administration of vitamin B₁. Preferably this should begin with the intravenous or intramuscular

injection of from 20 to 50 mg. of thiamin chloride N. N. R. daily, and this method should be employed as a routine in the more severe cases. After improvement has occurred, usually within two weeks, the dose may be decreased to 10 or 20 mg. daily, or the larger doses may be given by mouth. If the symptoms are not particularly severe or have been largely relieved by intensive treatment, brewers' yeast may be used instead of the crystalline form of the vitamin; doses of about 30 Gm. three times a day are recommended.

The response to such treatment may be prompt and spectacular, with marked improvement in a few days and complete disappearance of symptoms and signs within two or three weeks, or improvement may be gradual over a period of six or more weeks. Rapid improvement is said to be associated with diuresis, slowing of the heart rate and rise in the arterial pressure. If there is not clear evidence of improvement after adequate dosage of vitamin B₁ for several weeks it is probable that the cardiovascular manifestations are not due to vitamin deficiency. Beneficial effects do not follow the administration of this vitamin to patients with other types of heart failure.

Weiss has properly emphasized that deficiencies are seldom limited to a single vitamin, and these patients often present evidences of inadequate intake of vitamin A and of ascorbic (cevitamic) acid, of anemia, of hypoproteinemia and possibly of other dietary deficiencies. These should, of course, receive appropriate treatment simultaneously.

MALNUTRITION

The edema, often very extensive, associated with serious degrees of malnutrition is thought to be dependent in large part on the diminished proteins of the blood plasma and the consequent lowering of the colloid osmotic pressure. It is clear that this condition may be intimately related to and complicated by the vitamin deficiency state just discussed. Diuretics may be employed, but the logical and highly effective treatment is the correction of the nutritional state by means of a proper diet rich in proteins and in vitamins. Unless the patient is dying, the dropsy usually disappears with gratifying promptness.

PICK'S DISEASE

For many years the term "Pick's disease" was used loosely and inaccurately and was applied to a number of quite different pathologic states. Now, thanks largely to the clinical reports of White³¹ and the experimental and surgical studies of Beck,³² it is possible to say with conviction that Pick's disease is actually chronic constrictive pericarditis. For the details of this important advance in our knowledge, their original papers and those of Churchill³³ and of Burwell³⁴ should be consulted. Among the more important clinical features of the condition may be mentioned gradual onset of dropsy, disproportionate enlargement of the liver and ascites, increased venous pressure, low arterial pressure and a heart that is normal in size or smaller than normal. A single cause is responsible for all these manifestations: the heart is so encased by unyielding fibrosis:

31. White, P. D.: Chronic Constrictive Pericarditis (Pick's Disease) Treated by Pericardial Resection, *Lancet* 2: 539 (Sept. 7), 597 (Sept. 14) 1935.

32. Beck, C. S., and Griswold, R. A.: Pericardiectomy in the Treatment of the Pick Syndrome, *Arch. Surg.* 21: 1064 (Dec.) 1930. Beck, C. S.: The Surgical Treatment of Pericardial Scar, *J. A. M. A.* 97: 824 (Sept. 19) 1931. Beck, C. S., and Cushing, E. H.: Circulatory Stasis of Intrapericardial Origin: The Clinical and Surgical Aspects of the Pick Syndrome, *ibid.* 102: 1543 (May 12) 1934.

33. Churchill, E. D.: Decortication of the Heart (DeLorme) for Adhesive Pericarditis, *Arch. Surg.* 19: 1457 (Dec. 2) 1927.

34. Burwell, C. S., and Strayhorn, W. D.: Constrictive Cardia, *Arch. Surg.* 24: 196 (Jan.) 1932. Burwell, C. S., and Flickinger, D. D.: Obstructing Pericarditis, *Arch. Int. Med.* 56: 259 (Aug.) 1935.

28. Dick, M. W.; Warweg, Edna, and Andersch, Marie: Acacia in the Treatment of Nephrosis, *J. A. M. A.* 105: 654 (Aug. 31) 1935. *Liter.*

29. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi), *Ann. Int. Med.* 11: 104 (July) 1937; Disturbances of the Cardiovascular System in Nutritional Deficiency, *J. A. M. A.* 109: 786 (Sept. 4) 1937.

30. Strauss, M. B.: The Therapeutic Use of Vitamin B₁ in Polyneuritis and Cardiovascular Conditions, *J. A. M. A.* 110: 953 (March 26) 1938.

or calcified tissue as to be unable to dilate and fill properly during diastole. In some cases there is, in addition, marked constriction of the inferior vena cava. The immediate mechanisms of edema formation are those discussed under congestive heart failure.

The milder diuretics are of little or no value in this condition, although they may occasionally lengthen the interval between abdominal paracenteses. The mercurials, however, may prove extremely useful, as in the case reported by Noth.³⁵ A man aged 53 in seven and one-half years had had forty abdominal paracenteses and 450 injections of mercurial diuretics and had taken 6 Gm. (90 grains) of ammonium nitrate a day for three years. At the end of this time he presented no signs of hepatic or renal injury and had been able to continue an active life as a banker. However, if the diagnosis is reasonably certain and the patient is a good operative risk, the best treatment is surgical resection of the constricting pericardium. This often results in rapid and spectacular improvement and in restoration of the patient to normal activity, even after years of invalidism.

NEPHRITIS

The edema of acute nephritis is generally believed to be due in large part to widespread injury to the capillaries, which makes them more permeable than normally. It is theoretically unwise to administer diuretic drugs which might irritate an organ already acutely inflamed, and experience has shown conclusively that they are practically always devoid of beneficial action. In most cases diuretics are clearly unnecessary; if special circumstances seem to make a trial of such drugs essential, only the very mildest, such as urea or theobromine with sodium salicylate, should be used.

In chronic nephritis also diuretics are usually unnecessary if one excludes the "nephrotic syndrome" of chronic glomerulonephritis. But if edema becomes a serious problem almost any of the diuretics previously discussed may be used safely. The xanthines, urea and potassium salts may prove ineffective. The mercurial diuretics, combined with ammonium chloride or nitrate, are usually very satisfactory and almost never increase the renal disease. It is unwise to use these if there is acute renal inflammation or much retention of nitrogen in the blood, but extensive edema and nitrogen retention are seldom associated.

HEPATIC CIRRHOSIS

It is not often that ascites and edema of the lower extremities resulting from portal cirrhosis of the liver can be removed satisfactorily by means of diuretic drugs. It has been the almost universal experience that the milder ones, including the xanthines, urea and bismuth, are almost devoid of beneficial action. In occasional cases the mercurials, preceded by acid-forming salts, prove to be fairly satisfactory, but in most instances all that can be expected is a prolongation of the interval between abdominal paracenteses. This, however, is distinctly worth achieving, and a trial is always justified.

COMMENT

Even from the foregoing survey it is clear that the occurrence and removal of dropsy may present involved and baffling problems to the physician. Proper treatment of the underlying disease may result in disappearance of the edema, but often this must be supplemented by control of the diet, by diuretics and in some cases by surgical operation. It is highly encouraging to realize

that all the specific measures discussed in this article, with the exception of the xanthines, have come into general use in this country within the past fifteen years. Our knowledge of the mechanisms involved in the formation of edema and the occurrence of diuresis have steadily widened, and our use of specific remedies has consequently become more intelligent. It is not often that the disease responsible for dropsy can be wholly cured, as in vitamin deficiency and constrictive pericarditis, but the dropsy itself can often be controlled very satisfactorily by means of medical treatment for many months or years.

303 Whitney Avenue.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

CARRIER ROOM VENTILATOR, TYPE 56B, ACCEPTABLE

Manufacturer: The Carrier Corporation, Syracuse, N. Y.

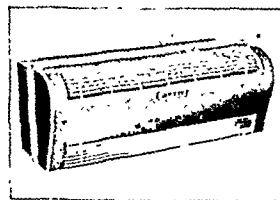
The Carrier Room Ventilator, Type 56B, is designed to cause the circulation of outside and inside air in a room and to filter out dust and pollen. The unit is equipped with a fluted filter consisting of two layers of crinoline enclosing a thin layer of cotton and fastened in a sturdy cardboard case. The unit also contains two motor-driven sirocco type blowers mounted in a metal case with louvers for the air outlets. The intake is located in the lower back of the unit, where it extends out of the window. A damper provides means for adjusting the proportions of outside and recirculated air. Sound insulation is also provided in the mechanism.

The ventilator comes in two sizes, the smaller one providing 250 cubic feet of air per minute and designed for average sized rooms. Dimensions are 24 inches long by 11½ inches deep and 9 inches high; the shipping weight is approximately 35 pounds. The larger size, designed for larger rooms, offices and apartments, supplies up to 500 cubic feet of air per minute. Dimensions are 31 inches long, 11½ inches high and 14¾ inches deep; the shipping weight is approximately 50 pounds.

The standard fan motor is a 110 volt, 60 cycle, single phase type. The larger unit has a variable speed adjustment; the smaller unit a single speed motor. The filter fits in the frame attached to the hinged top cover of the unit and is held in place by two adjustable levers.

The firm claims that the unit "supplies cleaned, outside air, without drafts; circulates filtered, refreshing, room air; shuts out noise, dirt, dust and pollen." The firm submitted evidence to support these claims and the following Council investigation was also conducted to test their validity:

The unit was installed as it would be in practice, and tests were conducted during a portion of the 1939 ragweed, hay fever season. Greased slides were placed at the outlet louvers, examined for pollen and compared with slides exposed outdoors. These tests showed an efficiency of the unit for pollen removal of more than 97 per cent for the first week of operation. It was permitted to run continuously for another week and again tested. There was no change in filters, the filters having been used for two weeks of continuous operation. At the end of this time the efficiency had dropped to 96 per cent for pollen removal. Apparently the filter loses some of its efficiency in time for holding pollen. The filter is of the discardable type and should be renewed as frequently as local conditions demand. The tests were conducted when there were large quantities of dust in the air. Coarse particles of dust may, by repeated bombardment



Carrier Room Ventilator,
Type 56B.

35. Noth, P. H.: Pick's Disease: A Record of Eight Years' Treatment with Salysrgan, Ammonium Nitrate and Abdominal Paracentesis. Proc. Staff Meet., Mayo Clin. 12: 513 (Aug. 18) 1937.

against the filter; rupture it sufficiently to allow passage of pollen, but this may happen to any filter.

In view of the foregoing report the Council on Physical Therapy voted to accept the Carrier Room Ventilator, Type 56B, for inclusion on the Council's list of accepted devices.

COLD QUARTZ ULTRAVIOLET LAMP EXEMPLAR MODEL ACCEPTABLE

Manufacturer: E. J. Rose Manufacturing Company, 727-733 East Gage Avenue, Los Angeles.

The Cold Quartz Ultraviolet Lamp, Exemplar Model, catalogue number 4005, provides ultraviolet generators of the body grid, tangency equalization and orificial types, and is designed strictly for use by physicians. The main lamp assembly consists of a detachable fused quartz grid attached to a corrugated aluminum reflector mounted to a reflector case; the dome shaped reflector case has an outside diameter of 31 cm. (12¼ inches) and consists of a bakelite back covering the burner electrodes and an aluminum shell which acts as a support for the burner and its reflector. The lamp is attached to a horizontal arm which pivots both at the upright standard and at a section joint. The arm may thus be extended to the full length of 25 inches or folded to a smaller length. The transformer, automatic timer, connecting receptacle for body grid and orificial generators and line cord connection are mounted in the floor base, while the orificial generator is contained within a case on the vertical part of the stand.

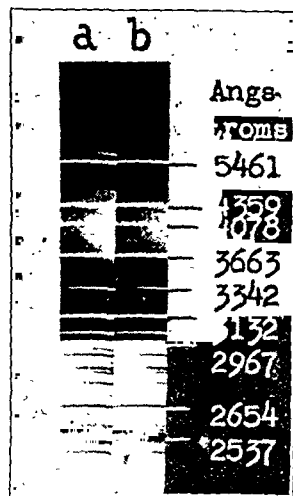


Fig. 1. Spectral energy distribution of the Cold Quartz Ultraviolet Lamp, Exemplar Model.

The lamp may be adjusted up to a height of 60 inches, and a pneumatic cushion is provided to prevent accidental shock to the grid element while it is being lowered. The lamp may be furnished either with the body grid generator alone (number 4005-B) or with the body grid plus the orificial generator, orificial cable, rayon protective sleeving and two pairs of goggles (number 4005-C).

Tubing of the grid is coiled in a flat, hexagonal pattern, is 7 mm. in diameter and has an exposed length of 60 inches. It is highly evacuated of air and the space is supplanted with an atmosphere of rare gases, xenon, krypton and argon, and a few drops of mercury. The cold quartz orificial unit is made of double core, fused quartz tubing and has a bakelite handle or case covering the electrode terminals. A high tension cable connects this unit to the standard high voltage transformer at the top of the tubular column.

The firm provided physical data from a reliable laboratory abstracted as follows: The power consumption of the lamp is 62 watts at 115 volts. During a two hour continuous test, no part of the lamp or transformer became heated.

It produced 900 microwatts per square centimeter of ultraviolet radiation at 16 inches. The spectral energy distribution measured by an ultraviolet photometer was 89 per cent between 2,000 and 2,600 angstroms, 10 per cent between 2,600 and 3,000 angstroms and 1 per cent between 3,000 and 3,200 angstroms. A spectrogram is shown in figure 1.

The orificial unit had the same spectral distribution as the general body lamp and sufficient energy to develop a perceptible erythema in less than one second when applied directly to the untanned skin. Physiologic tests on abdominal untanned skin

confirmed the photometer measurements as to erythema time with the body lamp. Physiologic tests gave a perceptible erythema in thirty seconds at 16 inches.

Tests made for the Council substantially confirmed this report. The Council on Physical Therapy voted to accept the Cold Quartz Ultraviolet Lamp, Exemplar Model, for inclusion on the Council's list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

E. R. SQUIBB & SONS WAS NOTIFIED OF THE ACCEPTANCE OF AMNIOTIN IN MAY 1933. AT THE TIME THAT THE DESCRIPTION WAS READY TO APPEAR IN THE JOURNAL, THERE AROSE QUESTIONS CONCERNING FURTHER CONSIDERATION OF THE STANDARDS. IT SEEMED ADVISABLE, THEREFORE, TO DEFER PUBLICATION OF THE ACCEPTANCE IN ORDER THAT, AT THE SAME TIME, THE REVISED STANDARDS MIGHT BE INCLUDED.

PAUL NICHOLAS LEECH, Secretary.

AMNIOTIN.—A liquid containing a highly concentrated, noncrystalline preparation of estrone (ketohydroxyestrin) together with a small varying amount of other estrogenic ketones extracted from the urine of pregnant mares.

Actions and Uses.—Amniotin is used either orally or by hypodermic injection of an oil solution in the same conditions for which estrone (theelin) and estriol (theelol) are recommended.

Dosage.—From 2,000 to 20,000 international units injected one or more times weekly depending on the response of the patient. After relief has been produced, dosage may be lowered to a maintenance level. As much as 15,000 international units per week may be required in resistant cases of kraurosis vulvae. Amniotin suppositories are valuable adjuncts in the treatment of senile vaginitis.

Occasionally a considerable amount of uterine bleeding occurs in menopausal women following large doses of estrogenic substance. This may be quite alarming at times and it is therefore suggested that the dose be reduced as soon as feasible.

For gonorrheal vaginitis in children from 1,000 to 2,000 international units daily in glycerogelatin suppositories may be required. This may be supplemented by intramuscular injection of small doses of the oil solution, if necessary. Changes in the secondary sex organs may be produced by this therapy, particularly if it is too prolonged. These changes usually regress on cessation of treatment. Estrogenic products must be used with care.

Amniotin capsules, 1,000 or 2,000 international units, one or more times daily may be administered orally alone or as a supplement to parenteral therapy.

Urine from pregnant mares, collected after the fifth month of pregnancy, is acidified with hydrochloric acid to pH 1.5 and boiled for three hours. The hydrolyzed urine is extracted with ethylene dichloride, and the extract evaporated to dryness. The residue is dissolved in ether, the ether solution is washed with half saturated sodium carbonate solution, followed by tenth normal sodium hydroxide and finally the ether removed by distillation. This residue is dissolved in sodium hydroxide. Amniotin is extracted from the toluene with normal sodium hydroxide. This alkaline extract, after neutralization with hydrochloric acid, is extracted with toluene, and the toluene solution, after washing with water, is evaporated to dryness.

This residue is further purified by high vacuum fractional distillation. The resulting residue is dissolved in sterile vegetable oil for hypodermic and oral use and incorporated in a glycerin gelatin base for vaginal administration.

Amniotin is assayed by a modification of the Conard and Burn method in direct comparison with the international standard. One international unit is defined by the League of Nations Health Organization as the specific estrus producing activity contained in 0.1 microgram (0.0001 mg.) of the standard crystalline ketohydroxy estrin ($C_{18}H_{26}O_2$). The physiologic criterion of activity is the appearance of cornified cells in the vaginal smear of a castrated rat.

Manufactured by E. R. Squibb & Sons, New York, N. Y. No U. S. patent. Trademark No. 318536.

Amniotin in Oil, 2,000 International Units: Each cubic centimeter contains 2,000 international units of estrogenic substance.

Amniotin in Oil, 10,000 International Units: Each cubic centimeter contains 10,000 international units of estrogenic substance.

Amniotin in Oil, 20,000 International Units: Each cubic centimeter contains 20,000 international units of estrogenic substance.

Amniotin Capsules, 1,000 International Units: Each capsule contains 1,000 international units of estrogenic substance.

Amniotin Capsules, 4,000 International Units: Each capsule contains 4,000 international units of estrogenic substance.

Amniotin Pessaries, 1,000 International Units: Each pessary contains 1,000 international units of estrogenic substance in a glycerogelatin base.

Amniotin Pessaries, 2,000 International Units: Each pessary contains 2,000 international units of estrogenic substance in a glycerogelatin base.



Fig. 2.—Cold Quartz Ultraviolet Lamp, Exemplar Model.

TUBERCULOSIS FACILITIES IN THE UNITED STATES

A FOLLOW-UP ON THE SURVEY OF 1933-1935 BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

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In 1935 the Council on Medical Education and Hospitals published a report of a two year study of tuberculosis facilities in the United States.¹ This was based on the inspection of 656 hospitals and sanatoriums, the analysis of 602 special questionnaires, and supplementary reports from 5,600 other hospitals that had been requested to furnish information concerning the hospitalization of tuberculous patients.

The original report contained the names of 1,240 institutions, 471 sanatoriums, 740 tuberculosis departments and twenty-nine preventoriums, all listed in accordance with the following classification: 1. Sanatorium—an institution operating exclusively for the treatment of tuberculosis. 2. Tuberculosis department—a hospital service devoted in part to tuberculosis care. 3. Preventorium—a separate unit for tuberculous contacts or children with the first infection type of disease. The preventorium classification did not include summer camps for children or preventorium units conducted as part of a sanatorium or other hospital service.

The same terminology will be retained in the present report, although additional information is now available concerning preventorium facilities in the sanatorium group.

PURPOSE OF SURVEY

The present report constitutes a follow-up on the survey of 1933-1935, conducted in large part by Fritjof H. Arestad, M.D., of the Council's staff of hospital examiners, who also directed the former study. It serves mainly to indicate the current status of tuberculosis hospitalization by recording changes in bed capacity and patient population over a period of five years, but also has for its purpose the presentation of factual data that can be utilized as a quantitative measure in the evaluation of sanatorium facilities.

A qualitative analysis is not a primary consideration at this time yet the report cannot help but reflect the degree of standardization that has been attained in individual institutions. Thus the survey should prove useful in the interpretation of sanatorium needs, a function that can best be ascribed to physicians specializing in tuberculosis, directors of sanatorium services, departments of health, tuberculosis associations and other agencies intimately concerned with the problem of tuberculosis control.

METHOD OF STUDY

The information required in the present investigation of sanatorium facilities was readily obtained in connection with the Annual Census of hospitals registered

(II) Tuberculosis Service:

(A reply is desired from all tuberculosis sanatoriums, hospitals and departments which admitted tuberculous patients during the twelve month period listed above.)

1. Number of beds set aside for tuberculosis:			
For adults.....	For children.....	Total.....	
2. How many of children's beds are for preventorium care?			
3. Patients admitted to tuberculosis service during year:			
Men.....	Women.....	Children (under 15 years).....	Total.....
4. Of patients admitted how many were received by transfer from other tuberculosis institutions?			
5. Condition on admission: Number of first infection type.....			
Minimal pulmonary tuberculosis.....	Moderately advanced.....	Far advanced.....	Nonpulmonary tuberculosis.....
6. Tuberculous patients discharged during year (exclude deaths):			
Men.....	Women.....	Children.....	Total.....
7. Of patients discharged how many were transferred to other institutions?			
8. Number of deaths from tuberculosis.....			
9. Census of patients in tuberculosis division:			
a. At beginning of twelve month period:			
Men.....	Women.....	Children Under 15.....	Total.....
b. Average daily census during year:			
Men.....	Women.....	Children Under 15.....	Total.....
c. Census on Sept. 30, 1935:			
Men.....	Women.....	Children Under 15.....	Total.....
10. Number on waiting list Sept. 30, 1935.....			
11. Is pneumothorax available for inpatients?.....			
For outpatients?.....			

1. Survey of Tuberculosis Hospitals and Sanatoriums in the United States, J. A. M. A. 105:1855 (Dec. 7) 1935.

by the American Medical Association. Accordingly, it did not seem necessary to repeat the inspection procedure carried out in the previous survey.

After consultation with the National Tuberculosis Association, the questionnaire on the preceding page was incorporated in the regular information blanks forwarded to 6,198 hospitals during the latter part of 1933.

Other sections of the blank requested information concerning ownership and control, scope of hospital and outpatient service, x-ray and laboratory facilities, nursing personnel, interns, resident physicians and medical staff.

patients admitted or treated during the year. This group includes 479 sanatoriums, 630 tuberculosis departments and thirty-one preventoriums. In addition there are 584 hospitals that admit tuberculous patients or conduct tuberculosis clinics yet did not report the extent of their service.

The variation from the 1935 report showing 1,240 institutions is largely a decrease in the number of tuberculosis departments from 740 to 630. This, in turn, is mainly a reduction in the nervous and mental field, in which only ninety-two departments were reported as compared to 193 in the previous survey.

Table 1.—Classification of Tuberculosis Institutions by States and by Control

State	Federal			State		County			City		City-County			Private			Totals			Total Institutions
	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Preventoriums	
Alabama.....	3	..	..	1	..	5	..	..	..	..	..	..	..	2	3	..	7	7	..	14
Arizona.....	4	6	..	1	..	..	..	..	..	..	..	..	..	10	6	..	15	17	..	23
Arkansas.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	5	..	7
California.....	2	10	..	..	..	12	22	3	..	..	1	1	..	24	10	..	39	45	8	52
Colorado.....	1	..	..	..	..	..	1	..	..	..	1	..	..	15	9	..	15	14	..	29
Connecticut.....	..	..	..	5	2	..	..	..	..	3	..	..	..	3	1	..	8	6	..	14
Delaware.....	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	2	1	5
Dist. of Columbia.....	5	..	..	..	..	..	..	..	1	2	..	..	..	..	3	..	1	10	..	11
Florida.....	..	..	..	1	3	2	3	..	..	4	..	..	..	2	3	1	7	15	1	23
Georgia.....	3	..	..	1	..	1	..	..	..	1	..	..	..	..	1	1	4	5	1	10
Idaho.....	1	..	..	..	1	..	..	..	..	..	..	..	..	..	3	..	1	4	..	5
Illinois.....	3	..	..	9	17	2	..	..	4	..	..	..	..	6	12	1	27	26	1	54
Indiana.....	2	..	..	1	1	9	..	..	..	1	..	..	..	..	4	..	10	8	..	18
Iowa.....	1	1	..	1	6	4	..	..	..	..	..	..	..	..	7	..	6	14	..	20
Kansas.....	..	5	..	2	1	1	..	..	..	..	1	..	..	..	5	..	4	11	..	15
Kentucky.....	1	2	..	1	4	2	..	..	..	1	1	..	..	..	5	..	5	12	..	17
Louisiana.....	..	2	..	1	1	..	..	..	..	..	..	..	..	4	4	..	8	5	..	12
Maine.....	..	2	..	3	2	..	..	..	..	..	..	..	..	1	3	..	4	7	..	11
Maryland.....	..	3	..	4	3	..	..	..	..	1	..	..	..	3	3	..	6	6	..	12
Massachusetts.....	..	2	..	4	7	7	1	..	2	7	..	..	..	9	9	1	22	26	1	49
Michigan.....	..	2	..	3	9	10	4	..	2	2	..	..	..	10	9	1	25	26	1	52
Minnesota.....	..	3	..	1	4	13	..	..	..	2	..	1	1	2	6	..	16	16	1	33
Mississippi.....	1	..	..	1	2	2	..	..	..	1	..	..	..	1	14	..	4	18	..	23
Missouri.....	4	..	..	1	1	1	..	..	2	6	..	..	..	..	8	1	6	19	1	27
Montana.....	3	..	..	..	..	1	..	..	..	..	1	..	..	..	4	..	1	9	..	10
Nebraska.....	2	..	..	1	2	..	1	..	..	1	..	..	..	..	2	..	1	8	..	9
Nevada.....	2	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	4	..	4
New Hampshire.....	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	2	1	..	3
New Jersey.....	..	..	..	1	6	11	3	..	..	5	..	..	..	5	8	1	17	23	1	40
New Mexico.....	3	4	..	1	1	..	..	..	..	..	..	..	..	3	6	..	9	11	..	19
New York.....	2	7	..	4	14	26	3	1	5	15	1	1	..	20	20	3	58	60	4	122
North Carolina.....	1	1	..	2	2	7	1	..	..	..	1	..	..	9	3	..	20	7	..	27
North Dakota.....	..	3	1	1	1	..	..	..	..	..	..	..	..	..	3	..	1	8	1	51
Ohio.....	..	2	..	1	8	15	..	..	1	2	..	..	..	5	15	2	22	27	2	49
Oklahoma.....	2	6	..	2	1	..	..	..	..	..	..	..	..	1	3	..	4	2	..	15
Oregon.....	..	1	..	2	1	1	..	..	..	..	..	..	..	1	..	..	5	10	..	16
Pennsylvania.....	2	..	..	3	10	4	5	1	1	4	1	1	..	7	14	1	16	36	2	55
Rhode Island.....	..	..	..	1	1	..	..	..	..	1	..	..	..	1	1	..	2	3	..	7
South Carolina.....	..	1	..	..	3	1	..	..	..	..	1	..	..	1	..	..	2	5	..	14
South Dakota.....	1	2	..	1	..	..	..	..	..	..	..	..	..	..	3	..	6	11	1	23
Tennessee.....	..	3	..	..	2	1	..	..	..	..	2	1	..	3	6	..	18	17	..	35
Texas.....	5	..	..	2	3	3	1	..	..	1	3	1	..	10	6	..	1	5	..	16
Utah.....	1	..	..	1	..	1	..	..	..	..	..	..	..	..	3	..	2	2	1	5
Vermont.....	..	..	..	2	1	..	..	..	..	..	..	..	..	..	1	1	..	6	..	12
Virginia.....	5	..	..	3	5	6	..	..	2	..	..	..	..	3	2	..	9	17	..	26
Washington.....	1	9	..	..	2	6	1	..	..	1	..	..	..	2	4	..	7	4	..	11
West Virginia.....	..	1	..	3	..	2	..	..	..	..	..	..	..	2	3	..	21	14	1	36
Wisconsin.....	3	..	..	2	3	17	1	1	..	..	..	..	..	2	7	..	1	4	..	5
Wyoming.....	3	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Totals.....	19	129	1	72	126	182	62	7	20	62	16	7	2	170	244	21	479	630	31	1,140

Reports were received from 5,950 hospitals, including all of the sanatoriums, the principal tuberculosis departments and all hospitals approved for intern and residency training. The completeness of returns, as measured by a total response of 96 per cent (99 per cent of bed capacity), testifies to the splendid cooperation extended by hospital and sanatorium superintendents. The statistical data included in this report represent a twelve months period ended either Sept. 30 or Dec. 31, 1933.

NUMBER OF TUBERCULOSIS INSTITUTIONS

Listed in the present report are 1,140 institutions that have either specified the number of beds for tuberculosis or else indicated the number of tuberculous

The sanatoriums in operation at the present time include nineteen federal, seventy-two state, 182 county, twenty municipal, sixteen city-county and 170 under private control. Reference should be made to table 1 and also to the corresponding section of the 1935 report. Of the federal sanatoriums, six are operated by the United States Veterans Bureau, one by the United States Public Health Service and twelve by the Indian Administration of the Department of the Interior.

Table 2, showing classification of tuberculosis institutions by control, contains comparative data for 1934. Included at present are 129 federal departments, 126 state, sixty-two county, sixty-two city, seven city-county and 244 private hospitals. A similar classification of

tuberculosis departments by type and control, as represented in table 3, shows that 439 are in general hospitals, ninety-two in mental institutions, twenty-six in isolation hospitals, eight in orthopedic units and sixty-

administrators. In the tuberculosis departments the corresponding figures are 344, 121 and 165; in the preventoriums, twelve, thirteen and six. Reference should be made to table 4 showing the classification of superintendents in accordance with the type of administrative control.

Table 2.—Tuberculosis Institutions Classified by Control

Control	Sanatoriums		Departments		Preventoriums		Total	
	1934	1938	1934	1938	1934	1938	1934	1938
Indian Administration..	11	12	41	32	..	1	52	45
U. S. Army.....	..	..	13	18	..	..	13	18
U. S. Navy.....	..	..	10	7	..	..	10	7
U. S. Public Health Serv.	1	1	25	19	..	..	26	20
Veterans Bureau.....	6	6	59	44	..	..	65	50
Other Federal.....	..	..	3	9	..	..	3	9
State.....	65	72	219	126	..	..	284	198
County.....	173	182	71	62	6	7	250	251
City.....	22	20	58	62	..	..	80	82
City-County.....	15	16	7	7	2	2	24	25
Private.....	178	170	234	244	21	21	433	435
Totals.....	471	479	740	630	29	31	1,240	1,140

five in other types of hospitals. It is of interest to note that there has been an increase from 418 to 439 in the general hospital group since the survey of 1935.

The preventoriums have increased from twenty-nine to thirty-one, but this group contains only those services that operate independently and on a permanent basis. This classification will be supplemented, however, by a

SIZE OF TUBERCULOSIS INSTITUTIONS

Tables 5 and 6 relate to the classification of tuberculosis institutions by size according to control and type of service. A marked similarity is noted on comparison with the former report except in the column showing

Table 3.—Classification of Tuberculosis Departments by Type and Control

Type	Federal	State	County	City	City-County	Private	Total
General.....	109	15	47	39	5	224	439
Mental.....	14	71	4	2	..	3	92
Orthopedic.....	..	..	5	20	1	..	26
Isolation.....	..	3	..	..	..	5	8
Classification.....	6	37	6	1	1	14	65
Totals.....	129	126	62	62	7	244	630

tuberculosis departments of less than twenty-five beds, which include all services that do not specify bed capacity yet report a certain number of tuberculous patients

Table 4.—Classification of Administrative Control

Superintendent	Federal			State			County			City			City-County			Private			Total		
	Sanatorium	Department	Preventorium	Sanatorium	Department	Preventorium	Sanatorium	Department	Preventorium	Sanatorium	Department	Preventorium	Sanatorium	Department	Preventorium	Sanatorium	Department	Preventorium	Sanatorium	Department	Preventorium
Doctor of Medicine.....	19	111	..	68	99	..	132	40	6	16	32	..	8	4	2	71	58	4	314	344	12
Registered Nurse.....	..	..	..	1	2	..	30	3	..	3	13	..	8	44	104	13	86	121	13	6	230
Layman.....	..	18	1	3	25	..	20	25	1	1	12	..	3	..	..	55	82	4	79	165	6
Totals.....	19	129	1	72	126	..	182	68	7	20	56	..	16	7	2	170	244	21	479	630	31

Table 5.—Tuberculosis Institutions Classified by Size and Control

Control	Less Than 25 Beds			25 to 49 Beds			50 to 99 Beds			100 Beds and Over			Total			Total Institutions
	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Preventoriums	Sanatoriums	Departments	Preventoriums	
Indian Administration.....	..	23	..	..	2	..	5	1	..	6	12	..	12	32	1	45
U. S. Army.....	..	15	..	..	1	..	..	1	..	..	1	..	..	18	..	18
U. S. Navy.....	..	5	..	..	1	..	..	1	..	..	..	..	..	7	..	7
U. S. Public Health Service.....	..	0	..	..	1	..	..	..	..	1	1	..	1	19	..	20
Veterans Bureau.....	..	15	..	..	12	..	..	5	..	6	12	..	6	44	..	50
Other Federal.....	..	7	..	..	..	..	..	1	..	..	1	..	..	9	..	9
State.....	51	..	..	..	..	..	5	37	..	62	24	..	72	126	..	198
County.....	10	23	12	34	16	1	67	12	12	71	11	12	182	62	7	251
City.....	..	23	..	..	9	..	3	13	..	17	15	..	20	62	..	82
City-County.....	1	1	..	..	1	..	5	1	12	8	3	..	16	7	12	25
Private.....	27	211	4	43	20	6	56	9	6	44	4	5	170	244	21	435
Totals.....	58	391	6	86	83	7	141	82	11	214	74	7	479	630	31	1,140

further description of preventorium facilities in sanatoriums and other hospitals. Included in the preventorium group are seven under county control, two city-county, twenty-one private and one operated by the Indian Administration.

It may be of interest at this time to note that 314 sanatoriums have physicians in charge, eighty-six have nurse superintendents and seventy-nine have lay

admitted or treated during the year. The decrease of ninety-three in this column approximates the reduction of 101 departments in the nervous and mental group as already referred to.

In the general hospitals there are 309 departments of less than twenty-five beds, fifty-one with a capacity of twenty-five to forty-nine beds, thirty-eight of fifty to ninety-nine beds and forty-one in the classification of

100 beds or over. As a rule, the smaller departments are utilized mainly for temporary care — emergency treatments, diagnostic procedures or tuberculosis sur-

Table 6.—Tuberculosis Departments Classified by Size and Type

Type	Less than 25 Beds	25 to 49 Beds	50 to 99 Beds	100 Beds and Over	Total
General.....	309	51	38	41	439
Mental.....	16	19	33	24	92
.....	6	6	6	8	26
.....	5	2	1	1	8
.....	55	5	5	..	65
Totals.....	391	83	82	74	636

gery—while the larger units may well be considered as regular sanatorium services.

Over half of the tuberculosis departments in isolation hospitals have more than fifty beds, yet from the stand-

BED CAPACITY

The survey of 1935 reported 95,198 beds for the treatment of tuberculosis. As indicated in table 7 there are now 98,801 beds available, including 87,084 for adults and 11,717 for children. Incidentally the capacity for children is practically identical with the figure of 11,647 reported in the previous survey. The sanatoriums have 70,713 beds, the tuberculosis departments 25,944 and the preventoriums 2,144. The private group reports 16,946 beds, federal hospitals 9,076 and the remaining public institutions 72,799: state 28,699, county 26,840, municipal 13,759, city-county 3,481. In federal hospitals the bed capacity for tuberculosis showed a decrease of 1,864; in the private group the reduction was 776. The other institutions, however, showed an increase of 6,187.

The federal hospitals report tuberculosis beds as follows: U. S. Army 617, U. S. Navy 152, U. S. Pub-

Table 7.—Bed Capacity of Tuberculosis Institutions Classified by States

State	Sanatoriums			Departments			Preven- toriums		Total Beds	
	Beds for Adults	Beds for Children	Total	Beds for Adults	Beds for Children	Total	Beds for Children	Adults	Children	Total
Alabama.....	352	12	364	103	5	108	...	455	17	472
Arizona.....	692	126	748	614	16	630	130	1,236	272	1,508
Arkansas.....	637	95	732	128	...	128	...	765	95	860
California.....	4,192	535	4,727	2,312	241	2,553	394	6,504	1,170	7,674
Colorado.....	1,400	76	1,476	908	...	908	...	2,308	76	2,384
Connecticut.....	1,234	427	1,661	213	...	213	...	1,447	427	1,874
Delaware.....	154	46	200	17	...	17	24	171	70	241
District of Columbia.....	400	300	700	348	6	354	...	748	306	1,054
Florida.....	525	22	547	322	4	326	25	847	51	898
Georgia.....	484	175	659	54	...	54	15	538	190	728
Idaho.....	...	132	132	45	...	45	...	45	132	177
Illinois.....	3,598	183	3,781	1,461	14	1,475	48	5,059	245	5,304
Indiana.....	1,373	142	1,515	204	...	204	...	1,577	142	1,719
Iowa.....	805	55	860	125	12	137	...	930	67	997
Kansas.....	629	44	673	124	6	130	...	753	50	803
Kentucky.....	958	125	1,083	324	1	325	...	1,282	126	1,408
Louisiana.....	369	16	385	500	...	500	...	869	16	885
Maine.....	429	56	485	105	...	105	...	534	56	590
Maryland.....	1,112	194	1,306	395	...	395	...	1,507	194	1,701
Massachusetts.....	3,038	530	3,568	1,236	39	1,295	135	4,294	704	4,998
Michigan.....	3,271	340	3,611	1,965	43	2,008	30	5,236	413	5,649
Minnesota.....	1,960	78	2,038	714	10	724	80	2,674	165	2,839
Mississippi.....	493	50	543	48	...	48	...	541	50	591
Missouri.....	1,748	86	1,834	405	14	419	81	2,153	181	2,334
Montana.....	198	10	208	42	9	51	...	240	19	259
Nebraska.....	128	33	161	217	...	217	...	345	33	378
Nevada.....	...	...	...	14	...	14	...	14	...	14
New Hampshire.....	221	25	246	...	...	...	...	221	25	246
New Jersey.....	2,967	340	3,307	1,338	97	1,435	225	4,305	682	4,987
New Mexico.....	570	81	651	418	5	423	...	988	86	1,074
New York.....	8,882	1,465	10,347	4,772	239	5,031	257	12,634	1,981	14,615
North Carolina.....	2,298	111	2,409	35	44	79	...	2,333	155	2,488
North Dakota.....	358	10	368	18	5	23	...	376	95	471
Ohio.....	2,693	456	3,149	891	27	918	100	3,784	583	4,367
Oklahoma.....	652	80	732	182	37	219	...	1,034	117	1,151
Oregon.....	570	36	606	6	1	7	...	576	37	613
Pennsylvania.....	3,454	693	4,147	1,599	112	1,711	188	5,653	993	6,646
Rhode Island.....	623	82	705	143	...	143	68	766	150	916
South Carolina.....	686	62	748	86	...	86	...	772	62	834
South Dakota.....	304	...	304	38	...	38	...	342	...	342
Tennessee.....	920	265	1,185	207	1	208	50	1,127	216	1,343
Texas.....	1,831	246	2,077	666	...	666	...	2,497	246	2,743
Utah.....	96	...	96	48	...	48	...	144	...	144
Vermont.....	127	...	127	1	...	1	80	123	60	183
Virginia.....	1,152	124	1,276	350	...	350	...	1,502	124	1,626
Washington.....	700	77	777	595	273	868	...	1,295	224	1,519
West Virginia.....	772	90	862	11	6	17	...	783	90	873
Wisconsin.....	2,010	154	2,164	269	1	270	134	2,279	269	2,548
Wyoming.....	33	...	33	20	...	20	...	53	...	53
Totals.....	62,423	8,283	70,713	24,656	1,288	25,944	2,144	87,084	11,717	98,801

point of bed capacity alone it would appear that the sanatorium service is the smaller of the two units in most of these institutions. In the sanatorium group thirty-eight have less than twenty-five beds, eighty-six have from twenty-five to forty-nine beds, 141 have from fifty to ninety-nine beds and 214 report 100 beds or more.

Indian Health Service 811, U. S. Veterans Bureau 5,671, Indian Administration 1,609, others 216.

The sanatorium division has 70,713 beds as compared to 64,997 in 1935. The federal sanatoriums have 3,970 beds, state sanatoriums 21,066, county 22,206, municipal 8,486, city-county 2,191, and the private sanatoriums 12,794. Six sanatoriums operated by the

United States Veterans Bureau have 2,713 beds, one under the control of the United States Public Health Service has 244, and twelve assigned to the Indian Administration report 1,013. Included in the sanatorium group are 8,285 beds for children distributed in the following manner as indicated in table 8: Indian Administration 319, state 2,877, county 2,706, city 1,149, city-county 436 and private 798.

Information concerning bed capacity in tuberculosis departments is contained in tables 7, 8 and 9. These indicate that general hospitals have 14,824 beds for tuberculosis, mental institutions 7,189, isolation hospitals 2,813, orthopedic units 283 and other institutions 835, a total of 25,944. This represents a reduction of 2,590 beds since the previous report, although increases of 358 and 257 occurred in the general and isolation hospitals respectively.

show that there were 122,342 admissions in 1938, including 59,599 men, 40,894 women, 13,400 children and 8,449 not classified. The number of readmissions are not known, but patients received by transfer from other institutions totaled 7,254.

The sanatoriums admitted 76,808 patients: 34,308 men, 29,049 women, 8,332 children and 5,119 unclassified. In table 11, showing admissions in tuberculosis institutions according to control, it can be seen that the private sanatoriums admitted 14,644, the federal sanatoriums 5,722 and the remaining public sanatoriums 56,442.

The tuberculosis departments reported 42,230 admissions: 9,178 in federal institutions, 6,880 in private hospitals and 26,172 in the other departments. Admissions to tuberculosis units in general hospitals totaled 34,739, isolation hospitals 4,112, mental institutions

Table 8.—Bed Capacity of Tuberculosis Institutions Classified by Control

Control	Sanatoriums			Departments			Preven- toriums	Total Beds		
	Beds for Adults	Beds for Children	Total	Beds for Adults	Beds for Children	Total	Beds for Children	Adults	Children	Total
Indian Administration.....	694	319	1,013	264	252	516	80	958	651	1,609
U. S. Army.....	...	...	...	611	6	617	...	611	6	617
U. S. Navy.....	...	...	...	152	...	152	...	152	...	152
Other Federal.....	244	...	244	567	...	567	...	811	...	811
State.....	2,713	...	2,713	2,938	...	2,938	...	5,671	...	5,671
County.....	...	...	...	216	...	216	...	216	...	216
City.....	18,189	2,877	21,066	7,496	137	7,633	...	25,685	3,014	28,699
City-County.....	19,500	2,706	22,206	3,770	374	4,144	490	23,270	3,570	26,840
Private.....	7,237	1,149	8,386	5,114	159	5,273	...	12,451	1,308	13,759
Totals.....	1,755	436	2,191	1,025	135	1,160	130	2,780	701	3,481
	11,906	798	12,704	2,483	225	2,708	1,444	14,479	2,467	16,946
Totals.....	62,428	8,285	70,713	24,656	1,288	25,944	2,144	87,034	11,717	98,751

Table 9.—Bed Capacity of Tuberculosis Departments Classified by Type and Control

Type	Federal			State			County			City			City-County			Private			Total		
	Adults	Children	Total	Adults	Children	Total	Adults	Children	Total	Adults	Children	Total	Adults	Children	Total	Adults	Children	Total	Adults	Children	Total
General	4,278	258	4,536	871	34	905	2,601	200	2,801	2,880	52	2,931	1,011	135	1,146	2,226	137	2,363	13,939	885	14,824
Mental	452	...	452	6,077	30	6,107	464	...	464	120	...	120	...	...	...	46	46	7,113	76	7,189	
	...	...	...	...	73	73	501	103	604	2,089	107	2,196	8	...	8	...	...	2,601	212	2,813	
Other hospitals	38	...	38	548	...	548	128	...	128	16	...	16	6	...	6	190	20	210	100	93	193
Totals	4,768	258	5,026	7,416	137	7,553	3,770	374	4,144	5,014	159	5,173	1,025	135	1,160	2,483	225	2,708	24,656	1,288	25,944

Federal departments reported 5,026 beds, state 7,633, county 4,144, city 5,273, city-county 1,160 and private departments 2,708. Included in these figures are 1,288 beds for children.

In the preventorium group are included thirty-one institutions with a capacity of 2,144 beds. A preventorium operated by the Indian Administration has eighty beds, seven under county control have 490, two classified as city-county accommodate 130 and twenty-one private preventoriums accommodate 1,444.

The preventorium service is more extensive, however, than has been indicated. Tables 27 and 28 show that there are 2,686 additional beds for preventorium purposes: 2,447 in the sanatorium division and 239 in the tuberculosis departments. Thus it is apparent that, of a total of 11,717 beds for children, 4,830 are now utilized for preventorium care.

NUMBER OF PATIENTS ADMITTED

In the previous investigation of tuberculosis facilities it was found that 121,706 patients were admitted during a period of one year. Reference to table 10 will

1,874, orthopedic units 475 and other departments 1,030. This indicates a decrease of 551 patients in the nervous and mental hospitals, 344 in the tuberculosis-isolation group and 2,385 in departments of general hospitals. Tuberculosis departments admitted 1,764 children.

In the preventorium group there were 3,304 children admitted: 100 in a federal preventorium for Indians, 413 in seven county preventoriums, 165 in two operated jointly under city and county control, and 2,626 in twenty-one private institutions. The total of 13,400 children admitted in all the tuberculosis institutions represents a decrease of 2,123 since the last report. Tables 27 and 28 contain further information relative to the hospitalization of children.

PATIENTS DISCHARGED

As shown in table 12, the sanatorium and tuberculosis departments discharged 85,620 patients in 1938, transferred 9,361 and reported 22,081 deaths, a total of 117,062 exclusive of discharges in the regular preven-

toriums. The latter did not list discharges but reported 3,304 admissions, which usually approximate the number of patients released. On the assumption, therefore, that the preventoriums discharged 3,304 patients, it is estimated that deaths, transfers and other discharges in tuberculosis institutions reached a total of 120,366.

This sum is quite similar to the annual admission rate of 122,342.

The sanatoriums discharged 57,952, transferred 3,314 and listed 12,375 deaths. In the departments, however, the number of transfers was 6,047, discharges 27,668 and deaths 9,706.

Table 10.—Number of Patients Admitted in Tuberculosis Institutions According to States
(Twelve Months Period Ended Sept. 30 or Dec. 31, 1938)

State	Sanatoriums					Departments					Preven- toriums	
	Men	Women	Children	Unclassified	Total	Men	Women	Children	Unclassified	Total	Children	Total Admissions
Alabama.....	158	181	17	202	558	158	6	...	...	164	...	722
Arizona.....	429	319	191	50	989	838	195	33	201	1,267	185	2,441
Arkansas.....	321	349	266	...	936	38	28	...	...	66	...	1,002
California.....	2,251	1,708	478	706	5,143	2,041	864	171	811	3,887	201	9,331
Colorado.....	457	262	63	84	866	1,703	158	11	74	1,946	...	2,812
Connecticut.....	654	588	96	...	1,338	141	67	5	2	215	...	1,553
Delaware.....	50	51	13	...	114	9	8	...	...	17	15	116
District of Columbia.....	345	307	...	...	652	556	399	16	281	1,232	...	1,904
Florida.....	423	363	30	36	852	258	172	3	16	449	137	1,433
Georgia.....	349	378	98	...	825	133	2	...	115	250	...	1,075
Idaho.....	...	...	203	...	203	29	19	2	...	50	...	233
Illinois.....	1,816	1,478	611	41	3,946	1,273	812	18	84	2,187	100	6,233
Indiana.....	557	781	315	338	1,991	137	84	3	...	224	...	2,215
Iowa.....	314	344	65	...	723	92	36	10	25	163	...	886
Kansas.....	152	183	151	...	486	227	42	10	39	318	...	801
Kentucky.....	972	388	159	19	1,538	117	66	6	142	331	...	1,869
Louisiana.....	241	162	18	...	421	1,363	470	148	...	1,981	...	2,402
Maine.....	205	253	37	...	495	115	38	...	...	153	...	618
Maryland.....	730	667	185	...	1,582	113	15	3	...	131	...	1,713
Massachusetts.....	1,413	1,160	287	8	2,868	477	319	46	43	885	306	4,059
Michigan.....	1,819	1,392	272	...	3,483	1,552	1,202	182	...	2,936	...	6,419
Minnesota.....	710	733	81	10	1,534	518	253	46	277	1,094	88	2,716
Mississippi.....	142	194	1	42	379	5	3	...	106	114	...	495
Missouri.....	1,049	943	96	...	2,088	425	277	80	21	803	34	2,925
Montana.....	119	78	11	...	208	111	49	24	...	184	...	321
Nebraska.....	61	90	24	...	175	57	39	...	67	163	...	333
Nevada.....	...	...	...	...	...	13	3	22	...	38	...	177
New Hampshire.....	69	88	20	...	177	...	...	...	...	...	...	5,861
New Jersey.....	1,714	1,385	331	...	3,430	976	586	70	174	1,806	628	5,861
New Mexico.....	421	136	82	...	639	570	164	16	3	753	...	1,362
New York.....	6,121	4,002	1,102	9	11,324	5,832	3,388	356	44	9,620	491	21,435
North Carolina.....	905	937	75	1,816	3,733	7	2	...	138	147	...	3,880
North Dakota.....	151	122	20	...	293	27	18	13	...	58	100	411
Ohio.....	1,459	1,356	509	244	3,568	977	537	41	193	1,750	295	5,613
Oklahoma.....	591	702	206	...	1,499	475	131	78	...	684	...	2,183
Oregon.....	275	244	39	...	558	...	...	...	...	...	...	553
Pennsylvania.....	1,869	1,804	722	88	4,483	1,479	853	23	130	2,483	231	7,129
Rhode Island.....	212	152	16	...	380	95	55	3	...	153	125	634
South Carolina.....	220	214	63	521	1,018	56	37	...	...	94	...	351
South Dakota.....	51	83	4	119	257	50	20	24	...	264	77	1,230
Tennessee.....	348	412	205	14	979	185	50	23	6	850	...	5,177
Texas.....	1,787	1,800	568	172	4,327	726	84	8	32	850	...	62
Utah.....	...	...	...	...	...	44	15	3	...	62	106	272
Vermont.....	88	73	4	...	165	1	...	...	...	1	...	1,800
Virginia.....	456	605	139	460	1,660	174	36	...	20	230	...	1,671
Washington.....	414	343	85	32	874	401	83	225	26	735	...	844
West Virginia.....	296	302	78	...	676	90	8	3	67	168	...	2,581
Wisconsin.....	1,092	911	206	108	2,317	608	146	34	191	981	85	2,581
Wyoming.....	32	26	...	...	58	19	6	3	...	28	...	87
Totals.....	34,208	29,049	8,332	5,119	76,808	25,201	11,845	1,764	3,330	42,220	3,294	122,342

Table 11.—Admissions in Tuberculosis Institutions Classified by Control

Control	Sanatoriums					Departments					Preven- toriums	
	Men	Women	Children	Unclassified	Total	Men	Women	Children	Unclassified	Total	Children	Total Admissions
Indian Administration.....	337	319	519	151	1,326	257	394	491	48	1,200	109	2,628
U. S. Army.....	...	...	...	...	...	1,735	75	6	...	1,817	...	1,817
U. S. Navy.....	...	...	...	...	...	177	...	...	...	177	...	1,072
U. S. Public Health Service.....	164	1	...	...	167	820	15	...	...	835	...	9,000
Veterans Bureau.....	2,440	13	...	1,760	4,220	4,589	...	...	281	4,870	...	2,579
Other Federal.....	...	...	...	...	...	209	41	6	16	270	...	2,579
State.....	8,971	9,231	2,729	1,023	21,954	2,720	1,098	252	201	4,271	...	2,579
County.....	9,828	9,167	2,529	1,204	22,728	2,567	1,563	401	1,104	5,637	415	2,579
City.....	4,520	3,226	1,177	...	8,923	7,059	5,077	229	574	13,859	...	4,722
City-County.....	1,683	1,029	394	3	2,712	1,194	622	29	...	1,915	165	2,112
Private.....	6,940	5,987	744	972	14,644	2,561	2,577	435	1,164	6,640	2,635	21,122
Totals.....	34,208	29,049	8,332	5,119	76,808	25,201	11,845	1,764	3,330	42,220	3,294	122,342

In 1934 there were 16,229 deaths in the sanatoriums and tuberculosis departments as compared to the present report of 22,081. The greater number of institutional deaths at present may be indicative of a growing use of sanatorium facilities for the care of far advanced, terminal cases.

NUMBER OF PATIENTS TREATED

As a further illustration of the scope of tuberculosis hospitalization, tables 13 and 14 have been prepared to show the number and classification of patients treated

ing to control. It is of further interest to note that 46,036 patients were treated in tuberculosis departments of general hospitals, 6,458 in mental institutions, 6,504 in tuberculosis-isolation hospitals, 481 in orthopedic units and 1,987 in other departments, a total of 61,466.

Data concerning the preventorium division are not complete. However, the reports at hand show 3,322 children treated in the private preventoriums, 469 in the county group, 240 in the city-county division and 163 in the preventorium operated by the Indian Administration, 4,194 in all.

Table 12.—Number of Patients Discharged in Tuberculosis Institutions During 1938 (Classified by States)

State	Sanatoriums				Departments				Preventoriums*	Total Discharges
	Discharges	Transfers	Deaths	Total	Discharges	Transfers	Deaths	Total		
Alabama.....	417	...	...	417	122	54	42	218	...	635
Arizona.....	684	...	10	694	949	59	191	1,199	...	1,893
Arkansas.....	742	...	11	753	38	13	33	84	185	1,022
California.....	3,513	444	593	4,550	3,580	509	1,155	5,244	...	9,794
Colorado.....	677	8	140	825	1,695	44	168	2,105	301	3,231
Connecticut.....	1,170	270	225	1,665	183	59	57	299	...	1,961
Delaware.....	77	2	39	118	4	...	1	5	...	123
District of Columbia.....	461	...	116	580	877	215	254	1,346	15	1,941
Florida.....	219	19	135	373	284	53	124	461	...	634
Georgia.....	760	...	68	828	88	41	6	135	137	1,100
Idaho.....	120	3	5	128	37	1	7	45	...	173
Illinois.....	3,339	156	644	4,139	993	264	878	2,105	...	6,244
Indiana.....	1,483	12	269	1,764	131	13	79	223	100	2,087
Iowa.....	519	15	124	658	71	12	19	102	...	760
Kansas.....	436	...	96	532	201	81	33	315	...	847
Kentucky.....	1,270	19	221	1,510	136	12	56	204	...	1,714
Louisiana.....	164	21	109	294	644	50	310	1,004	...	1,298
Maine.....	413	45	75	533	123	62	30	215	...	748
Maryland.....	1,360	18	292	1,670	119	37	37	193	...	1,863
Massachusetts.....	2,254	202	663	3,119	669	76	306	1,051	306	4,476
Michigan.....	2,744	413	665	3,822	2,036	956	649	3,641	...	7,463
Minnesota.....	1,337	100	305	1,742	998	134	193	1,325	88	3,155
Missouri.....	266	3	76	345	24	...	7	31	...	376
Montana.....	1,242	72	386	1,700	384	284	310	978	34	2,712
Nebraska.....	161	...	35	196	112	18	44	174	...	370
Nevada.....	127	...	27	154	136	7	50	193	...	347
New Hampshire.....	...	...	...	...	39	6	7	52	...	52
New Jersey.....	143	...	32	175	22	...	2	24	...	199
New Mexico.....	2,292	40	876	3,208	945	220	595	1,760	628	5,596
New York.....	421	1	73	495	448	26	88	562	...	1,057
North Carolina.....	8,579	618	2,086	11,283	5,140	1,371	2,015	8,526	491	20,300
North Dakota.....	2,844	100	485	3,429	5	5	8	18	...	3,456
Ohio.....	269	...	40	309	40	16	8	64	100	473
Oklahoma.....	2,788	150	625	3,563	1,338	599	359	2,326	295	6,184
Oregon.....	1,272	3	174	1,449	497	37	81	615	...	2,064
Pennsylvania.....	456	68	90	614	...	...	...	...	...	614
Rhode Island.....	3,462	273	749	4,484	1,468	119	886	2,473	231	7,188
South Carolina.....	199	1	97	297	80	10	50	140	125	562
South Dakota.....	638	...	149	807	85	28	11	124	...	931
Tennessee.....	158	...	22	180	82	16	16	114	...	294
Texas.....	487	4	223	714	180	92	31	303	77	1,094
Utah.....	3,733	25	335	4,113	651	60	133	834	...	4,947
Vermont.....	...	...	...	...	35	5	19	59	...	59
Virginia.....	143	...	44	187	24	...	3	27	106	320
Washington.....	1,272	6	320	1,598	101	40	66	207	...	1,805
West Virginia.....	748	18	154	920	894	49	128	981	...	1,901
Wisconsin.....	418	3	93	514	91	49	14	154	...	668
Wyoming.....	1,573	173	371	2,117	774	246	114	1,134	85	3,336
Totals.....	57,932	3,314	12,375	73,621	27,668	6,047	9,706	43,421	3,304	120,366

* Admissions in lieu of discharges.

during a twelve months period. The impressive total of 202,021 treated in 1938 agrees closely with the estimate of 203,436 obtained in the previous survey, when 82 per cent of the institutions reported 166,818 patients treated.

The sanatoriums now show a total of 136,361 patients treated, the departments 61,466 and the preventorium 4,194. In this group are 96,924 men, 69,840 women, 21,324 children and 13,933 unclassified. The private institutions treated 36,211, the federal hospitals 22,046 and the remaining tax-supported institutions 143,764. Reference should be made to table 14 for information concerning the number of patients treated in the various institutions, all of which have been classified accord-

DAILY CENSUS

In the 1935 report it was shown that 81,652 patients were under treatment in tuberculosis institutions on the day of reporting and that the average daily census was 81,952 on the basis of 69,024 patients in institutions, representing 83.8 per cent of the total bed capacity. The present report shows 79,679 patients present at the beginning of the year, 79,300 as the average daily census and 80,403 under treatment at the end of the twelve months period.

Table 15 indicates an average daily census of 61,288 in the sanatorium group, 17,122 in the tuberculosis departments and 890 in the preventorium. Federal institutions reported an average daily census of 6,766,

state 22,501, county 22,342, city 12,337, city-county 3,065 and private institutions 12,289. For corresponding data concerning the sanatoriums, tuberculosis departments and preventoriums, reference should be made to table 16.

In the group of tuberculosis departments the general hospitals reported an average census of 10,119, mental institutions 3,858, tuberculosis-isolation hospitals

2,448, orthopedic units 207 and other hospitals 490 (table 17). The number of patients present in the sanatoriums, tuberculosis departments and preventoriums at the beginning of the year is shown in table 18.

AVERAGE LENGTH OF STAY

Information concerning the average length of stay was furnished by 456 sanatoriums which reported

Table 13.—Patients Treated in Tuberculosis Institutions During Year

State	Sanatoriums					Departments					Preven- toriums	
	Men	Women	Children	Unclassified	Total	Men	Women	Children	Unclassified	Total	Children	Grand Total
Alabama.....	221	241	30	292	784	256	6	...	...	262	...	1,065
Arizona.....	646	438	253	50	1,387	1,114	211	33	322	1,680	185	3,252
Arkansas.....	601	698	366	...	1,665	80	42	...	...	122	...	1,787
California.....	4,132	3,166	982	707	8,987	2,680	1,189	351	1,497	5,717	461	15,165
Colorado.....	1,006	569	119	84	1,778	2,160	231	12	251	2,654	...	4,432
Connecticut.....	1,333	1,161	396	...	2,890	179	70	6	112	366	...	3,255
Delaware.....	121	119	45	...	285	9	8	...	...	17	...	307
District of Columbia.....	557	489	...	...	1,046	698	466	16	310	1,490	...	2,536
Florida.....	710	615	30	36	1,391	349	243	4	35	631	137	2,174
Georgia.....	554	595	246	...	1,395	149	2	...	115	266	...	1,661
Idaho.....	...	...	280	...	280	39	33	2	1	75	...	355
Illinois.....	3,200	2,682	782	225	6,949	2,160	1,311	30	105	3,606	100	10,655
Indiana.....	1,006	1,815	438	527	3,256	245	115	6	...	366	...	3,622
Iowa.....	587	686	98	153	1,524	137	71	10	27	245	...	1,769
Kansas.....	314	421	185	...	920	291	61	12	39	403	...	1,323
Kentucky.....	1,497	680	269	19	2,465	136	73	6	305	520	...	3,005
Louisiana.....	354	270	25	...	649	1,664	592	148	...	2,404	...	3,053
Maine.....	385	508	66	...	959	169	84	3	...	256	...	1,215
Maryland.....	1,255	1,133	398	11	2,797	357	76	3	2	438	...	3,235
Massachusetts.....	2,677	2,355	753	112	5,897	900	599	56	69	1,624	358	7,579
Michigan.....	2,941	2,385	370	764	6,460	2,388	1,860	213	154	4,615	...	11,084
Minnesota.....	1,543	1,621	149	10	3,323	875	493	54	277	1,664	163	5,139
Mississippi.....	255	334	2	42	633	27	18	...	106	151	...	784
Missouri.....	1,710	1,688	129	...	3,527	552	370	94	21	1,037	34	4,568
Montana.....	244	144	21	...	409	133	57	27	6	222	...	611
Nebraska.....	103	145	52	...	305	117	91	3	67	278	...	581
Nevada.....	...	...	...	...	...	16	4	27	...	47	...	262
New Hampshire.....	149	170	43	...	362	...	...	...	...	...	...	955
New Jersey.....	3,101	2,514	591	2	6,208	1,466	1,015	140	199	2,820	847	9,031
New Mexico.....	770	215	161	...	1,146	789	191	17	48	1,045	...	2,191
New York.....	10,946	7,147	2,334	294	20,721	8,171	5,127	492	322	14,112	550	35,292
North Carolina.....	2,117	1,493	169	1,984	5,763	7	2	...	138	147	...	6,915
North Dakota.....	280	299	40	...	619	29	19	14	...	62	163	841
Ohio.....	2,754	2,552	1,016	245	6,567	1,109	647	49	693	2,503	335	9,405
Oklahoma.....	835	1,067	322	...	2,224	541	149	100	...	791	...	3,065
Oregon.....	544	494	77	...	1,115	...	...	...	4	4	...	1,119
Pennsylvania.....	3,513	3,274	1,332	91	8,210	2,005	1,295	41	162	3,503	311	12,114
Rhode Island.....	441	344	46	...	831	127	70	3	47	247	165	1,256
South Carolina.....	330	345	114	892	1,681	76	66	...	...	142	...	1,793
South Dakota.....	193	202	4	205	574	70	22	30	...	122	...	694
Tennessee.....	665	806	431	16	1,918	195	55	23	6	279	77	2,274
Texas.....	2,614	2,622	648	170	6,060	782	169	8	287	1,166	...	7,226
Utah.....	...	...	...	...	...	64	25	3	21	113	...	113
Vermont.....	141	127	4	...	272	2	...	...	...	2	176	328
Virginia.....	825	1,000	200	794	2,819	303	114	...	20	442	...	2,957
Washington.....	765	645	141	63	1,614	702	193	417	26	1,342	...	2,957
West Virginia.....	627	646	138	...	1,411	97	8	3	67	175	85	1,595
Wisconsin.....	1,938	1,764	330	108	4,140	752	164	37	196	1,149	...	5,289
Wyoming.....	45	36	...	...	81	32	7	4	...	43	...	124
Totals.....	61,620	52,225	14,634	7,872	136,361	35,294	17,615	2,496	6,061	61,466	4,194	292,921

Table 14.—Number of Patients Treated in Tuberculosis Institutions Classified by Control.

Control	Sanatoriums					Departments					Preven- toriums	
	Men	Women	Children	Unclassified	Total	Men	Women	Children	Unclassified	Total	Children	Grand Total
Indian Administration.....	470	425	769	237	2,902	463	423	614	74	1,570	163	3,541
U. S. Army.....	...	...	...	...	...	2,131	105	6	29	2,271	...	2,271
U. S. Navy.....	...	...	...	...	...	290	...	...	...	290	...	290
Public Health Service.....	342	3	...	...	345	1,222	19	...	...	1,241	...	1,241
Veterans Bureau.....	4,756	54	...	1,769	6,679	6,442	...	...	...	6,442	...	12,921
Other Federal.....	...	...	...	...	...	...	...	...	...	...	...	...
State.....	19,125	16,632	5,691	2,119	39,567	4,553	2,511	282	892	9,248	...	49,815
County.....	18,765	17,257	4,923	1,772	36,717	2,570	2,651	751	1,222	8,594	469	39,911
City.....	8,619	5,919	1,782	837	16,957	19,422	6,731	284	984	27,421	...	44,378
City-County.....	1,841	1,879	919	...	4,639	1,453	85	...	493	2,431	249	2,680
Private.....	11,472	9,584	1,299	1,225	23,580	3,729	3,928	496	1,746	8,909	3,222	12,131
Totals.....	61,620	52,225	14,634	7,872	136,361	35,294	17,615	2,496	6,061	61,466	4,194	292,921

22,370,120 treatment days and a total of 136,361 patients treated. Hence the average number of days per patient is 164 as compared to 166 in the previous report. Three hundred and ten tuberculosis departments gave 6,249,530 treatment days to 61,466 patients. This indicates an average stay of 101 days, the identical figure reported in 1935.

Incomplete reports from the preventoriums would indicate an average length of stay of seventy-seven days on the basis of 4,194 patients treated and 324,850 treat-

responsibility in the rehabilitation of patients. Then the period of hospitalization will no doubt be extended to include suitable programs of graduated exercise and courses of vocational training now lacking in most of the institutions. A well balanced sanatorium service is one that gives due consideration not only to prevention and therapy but also to rehabilitative measures that may prevent a further reactivation of the disease. As the incidence of tuberculosis decreases it is logical to assume that further emphasis will be placed on the

Table 15.—Average Daily Census in Tuberculosis Institutions by States

State	Sanatoriums					Departments					Preven- toriums	Grand Total
	Men	Women	Children	Unclassified	Total	Men	Women	Children	Unclassified	Total	Children	
Alabama.....	80	87	12	71	250	90	...	...	1	91	...	341
Arizona.....	213	122	85	49	469	281	17	1	113	412	...	881
Arkansas.....	243	300	96	...	639	42	14	...	...	56	...	735
California.....	1,676	1,496	491	460	4,123	537	249	68	809	1,663	160	5,946
Colorado.....	341	219	7	381	948	48	19	4	219	290	...	1,238
...	621	530	333	56	1,540	36	11	...	2	49	...	1,589
...	79	71	23	...	173	...	...	...	...	...	20	193
...	265	250	...	...	515	178	102	...	8	288	...	803
...	194	197	22	80	493	65	41	1	40	147	...	640
...	122	145	39	235	541	9	...	...	...	9	...	550
Georgia.....	...	...	125	...	125	9	13	1	1	24	...	149
Idaho.....	1,382	1,134	138	516	3,161	636	297	10	106	1,049	...	4,213
Illinois.....	359	454	97	398	1,308	115	25	...	...	140	...	1,448
Indiana.....	295	369	30	64	758	7	...	...	2	9	...	767
Iowa.....	131	213	34	45	423	69	18	2	2	91	...	514
Kansas.....	507	305	110	...	922	16	1	...	163	185	...	1,107
Kentucky.....	122	111	11	...	244	113	...	...	283	396	...	640
Louisiana.....	188	246	20	...	454	53	45	3	...	101	...	555
Maine.....	540	468	208	...	1,216	109	5	...	183	302	...	1,518
...	1,113	1,038	385	531	3,067	218	191	7	190	516	52	3,635
...	923	708	59	1,432	3,122	730	582	42	141	1,495	...	4,617
...	805	864	54	60	1,783	331	186	3	77	597	75	2,455
...	12	13	...	254	279	...	...	...	...	...	...	279
Missouri.....	609	738	34	155	1,516	48	18	7	197	270	...	1,886
Montana.....	127	66	10	...	203	17	9	4	6	35	...	238
Nebraska.....	50	71	33	...	154	51	45	...	10	106	...	260
Nevada.....	...	...	...	...	...	...	1	...	...	1	...	1
...	79	93	18	...	190	...	...	...	...	...	...	190
...	1,411	1,137	318	30	2,696	326	278	71	316	991	219	4,106
New Mexico.....	278	41	42	131	492	225	24	...	45	294	...	786
New York.....	4,228	3,012	960	1,387	9,587	2,518	1,544	139	159	4,360	68	14,015
North Carolina.....	415	460	69	1,151	2,104	...	...	...	...	...	...	2,104
North Dakota.....	137	164	12	...	313	1	1	...	1	3	63	379
Ohio.....	1,204	1,069	291	477	3,041	38	11	4	156	209	40	3,290
Oklahoma.....	275	300	68	64	797	97	5	23	39	164	...	961
Oregon.....	241	255	45	...	541	...	...	...	4	4	...	545
...	1,682	1,536	634	...	3,852	659	415	5	86	1,165	80	5,097
...	274	227	...	...	501	...	...	...	45	45	43	559
...	124	131	54	386	695	19	25	...	...	44	...	739
South Dakota.....	64	84	...	101	249	20	...	...	61	81	...	330
Tennessee.....	265	273	127	345	950	10	4	3	...	17	...	967
Texas.....	813	701	80	102	1,696	38	7	...	276	321	...	2,017
Utah.....	...	...	...	...	...	...	...	...	40	40	...	40
Vermont.....	58	62	...	...	110	...	...	...	...	1	70	181
Virginia.....	191	178	24	736	1,129	141	80	...	...	221	...	1,350
Washington.....	213	213	41	236	693	379	11	168	58	616	...	1,399
West Virginia.....	336	403	77	24	840	5	...	...	...	5	...	845
Wisconsin.....	912	921	66	98	1,997	184	17	...	5	206	...	2,203
Wyoming.....	12	14	...	...	26	12	...	...	1	13	...	39
Totals.....	24,293	21,658	5,382	10,039	61,288	8,481	4,311	566	3,764	17,122	890	79,300

ment days. The returns were likewise incomplete in 1935, when estimates ranging from seventy-nine to eighty-four days were made.

Tables 19 and 20 refer to the average stay in sanatoriums classified by states and according to control. In the federal sanatoriums the average is 138 days, in state sanatoriums 170, county 171, municipal 175, city-county 156 and private 147. The corresponding figures for 1934 were 172, 166, 173, 170, 165 and 151 respectively.

The average length of stay in the sanatorium group is apparently decreasing as a result of continuing improvements in the medical and surgical therapy of tuberculosis. It may eventually increase, however, when the sanatoriums begin to realize their full

continued hospitalization of far advanced cases especially in states in which there may be an adequate number of tuberculosis beds. This method of protective isolation should also tend to increase the average length of hospitalization.

THE WAITING LIST

The sanatoriums reported 7,572 patients on the waiting list, the tuberculosis departments 1,225, a total of 8,797 as compared to 9,854 in 1935. There were 198 tuberculous patients awaiting admission to Veterans' hospitals, 180 to hospitals of the Indian Administration, 900 to private institutions and 7,519 to the remaining tax-supported institutions: state 5,106, county 1,368, city-county 329 and municipal 716.

Tuberculosis departments in general hospitals reported 888 patients awaiting admission, tuberculosis-isolation hospitals 313 and other departments twenty-four, a total of 1,225.

It is apparent that the present waiting list is largely the result of unequal distribution, since the number of vacant beds, 16,254 in all, exceeds the number of applications now pending by 7,457. As shown in table 21, there are 9,577 vacancies in the sanatoriums, 2,005 more than the number of patients awaiting hospitalization in this group. In the state and city-county sanatoriums, however, the waiting list is considerably greater than the number of vacancies. Vacant beds in the tuberculosis departments total 6,677, or 5,452 more than the number of patients now applying for admission. It should be noted, however, that the municipal departments have a waiting list nearly twice the number of vacancies.

CONDITION OF PATIENTS ON ADMISSION

In the present survey 427 sanatoriums and 345 tuberculosis departments reported on the condition of patients on admission. As shown in table 22, there

Pulmonary cases of the reinfection type totaled 80,088. Of these 12.9 per cent were admitted in the minimal stage, 32.1 per cent as moderately advanced and 55 per cent as far advanced. The report of 1935 showed corresponding ratios of 13.1, 29.7 and 57.2 per cent and the National Tuberculosis Association reported 16, 30 and 54 per cent in 1931. Since 1931 the percentage of early diagnoses has decreased from 16 to 12.9 per cent. This may represent only a relative decline, however, in view of the increasing use of sanatorium facilities for segregation of advanced, infectious cases of pulmonary tuberculosis. Formerly a number of sanatoriums attempted to limit their admissions to early cases but advances in treatment and a fuller realization of the importance of isolation as a control measure have helped to eliminate restrictions of this type.

A decrease in the percentage of first infection type of disease has apparently occurred, although it should be noted that 3,304 unclassified admissions to the preventorium group were not included in the foregoing study. Obviously, it would not have been accurate to assume that all these children were of the first infection type. Previous reports show that preventorium have accepted

Table 16.—Average Daily Census in Tuberculosis Institutions by Control

Control	Sanatoriums					Departments					Preven- toriums	Grand Total
	Men	Women	Children	Unclassified	Total	Men	Women	Children	Unclassified	Total	Children	
Indian Administration.....	100	133	240	367	840	26	28	173	55	282	63	1,155
U. S. Army.....	...	...	...	...	...	33	1	...	8	42	...	42
U. S. Navy.....	...	...	...	...	...	100	...	...	...	100	...	100
Public Health Service.....	171	2	...	...	173	351	5	...	56	412	...	565
Veterans Bureau.....	908	7	...	1,483	2,398	1,946	...	...	399	2,345	...	4,743
Other Federal.....	...	...	...	...	...	69	29	...	13	111	...	111
State.....	7,028	7,275	1,981	2,261	18,545	1,475	1,430	27	1,024	3,956	...	22,501
County.....	7,876	7,374	2,005	2,531	19,786	1,350	775	226	454	2,805	66	22,512
City.....	3,451	2,003	534	1,372	7,960	2,379	1,400	35	503	4,377	...	12,337
City-County.....	646	583	166	580	1,975	237	148	43	567	995	75	3,665
Private.....	4,029	3,681	436	1,445	9,591	515	435	62	685	1,697	696	12,289
Totals.....	24,209	21,658	5,382	10,039	61,288	8,481	4,311	566	3,764	17,122	890	79,900

are 97,632 patients included in this study: 6,081 first infection type, 10,301 minimal pulmonary tuberculosis, 25,740 moderately advanced, 44,047 far advanced, 4,678 nonpulmonary forms and 6,785 others.

From these data it is apparent that approximately 7 per cent of the patients are nontuberculous, while 93 per cent have some form of tuberculous infection. Of the cases of tuberculosis, 90,847 in all, 6.7 per cent were

not only the first infection type of tuberculosis but also nontuberculous patients, extra-pulmonary cases and occasionally the adult type of disease.

DIAGNOSTIC AND THERAPEUTIC FACILITIES

Tables 23 and 24 contain information concerning x-ray and laboratory departments, pneumothorax facilities and outpatient clinics in the tuberculosis departments and sanatoriums. From these data it would appear that the use of collapse therapy is steadily increasing, since 442 sanatoriums and 328 tuberculosis departments report facilities for artificial pneumothorax at present as compared to 406 sanatoriums and 101 departments in 1935. It is likewise encouraging to note that 361 sanatoriums and 222 departments have made further arrangements for the administration of collapse therapy in the outpatient clinics. All the federal sanatoriums have facilities for pneumothorax, sixty-seven state sanatoriums, 173 county, eighteen city, fourteen city and county and 151 private. Increases are noted in all these divisions except the municipal group, which reported the same number in 1935. Tuberculosis departments are likewise extending the use of collapse therapy, as evidenced by the presence of pneumothorax equipment in 237 general hospitals, thirty-nine mental institutions, twenty tuberculosis-isolation hospitals, one

Table 17.—Average Daily Census in Tuberculosis Departments According to Type

Type	Men	Women	Children	Unclassified	Total
General.....	5,226	1,778	453	2,632	10,119
Mental.....	1,724	1,501	8	535	3,558
Tb-Isolation.....	1,242	815	87	304	2,448
Orthopedic.....	78	112	17	...	207
All Other Hospitals.....	201	15	1	273	490
Totals.....	8,481	4,311	566	3,764	17,122

classified as first infection type, 5.1 per cent as nonpulmonary forms and 88.2 per cent as frank pulmonary tuberculosis. In previous reports the corresponding figures were 8.7, 4.1 and 87 per cent respectively, while in 1931 the National Tuberculosis Association reported 8.4 and 88 per cent.

orthopedic unit and twenty-seven other departments. Special arrangements for an outpatient pneumothorax service have also been made in 189 departments of general hospitals, six mental institutions, fifteen tuberculosis-isolation hospitals, one orthopedic department and ten other units.

X-ray departments are now furnished in 410 sanatoriums and 568 tuberculosis departments, whereas in 1935 there were 368 sanatoriums in which roentgenographic or fluoroscopic facilities were available. All the

ments and physicians in charge in 224. Laboratory units were also present in 558 tuberculosis departments with 479 under medical supervision. The classification of laboratories by states and control will be found in tables 23 and 24. It can be added, however, that 403 tuberculosis departments in general hospitals have laboratory facilities, eighty-two in mental institutions, eighteen in tuberculosis-isolation hospitals and fifty-four in other departments including seven orthopedic units.

Table 18.—Census of Patients in Tuberculosis Institutions at Beginning of Year (by States)

State	Sanatoriums				Departments					Preven- toriums	Grand Total
	Men	Women	Children	Unclassified	Men	Women	Children	Unclassified	Total	Children	
Alabama.....	63	60	13	90	226	98	...	...	98	...	324
Arizona.....	217	119	62	...	398	276	16	...	413	...	811
Arkansas.....	280	349	100	...	729	42	14	...	56	...	785
California.....	1,881	1,483	504	1	3,844	639	325	180	630	1,830	5,634
Colorado.....	549	307	56	...	912	457	73	1	177	708	1,620
Connecticut.....	679	573	300	...	1,552	38	3	...	110	151	1,703
Delaware.....	71	68	32	...	171	...	...	...	...	20	191
District of Columbia.....	212	182	...	...	394	142	67	...	29	238	632
Florida.....	287	232	...	...	539	91	71	1	19	182	721
Georgia.....	205	217	148	...	570	16	...	...	16	...	586
Idaho.....	...	...	77	...	77	10	14	...	1	25	102
Illinois.....	1,444	1,204	171	184	3,003	887	490	12	21	1,419	4,422
Indiana.....	449	534	123	169	1,235	108	31	...	142	...	1,437
Iowa.....	273	342	33	153	801	45	35	...	2	82	883
Kansas.....	102	238	34	...	434	64	19	...	...	85	519
Kentucky.....	525	292	110	...	927	19	7	...	103	189	1,116
Louisiana.....	113	108	7	...	228	301	122	...	423	...	651
Maine.....	180	255	29	...	404	54	46	...	103	...	567
Massachusetts.....	525	460	213	11	1,215	244	61	...	2	307	1,522
Michigan.....	1,204	1,105	460	104	3,029	423	280	10	26	739	3,820
Minnesota.....	1,122	993	107	764	2,986	836	653	31	154	1,679	4,665
Mississippi.....	833	888	68	...	1,789	357	205	8	...	570	2,434
Missouri.....	113	140	1	...	254	22	15	...	...	37	291
Montana.....	661	745	33	...	1,439	127	93	14	...	234	1,673
Nebraska.....	125	66	10	...	201	22	8	...	5	38	239
Nevada.....	47	55	28	...	130	60	52	...	115	...	245
New Hampshire.....	...	...	...	...	...	3	1	...	...	9	9
New Jersey.....	60	82	23	...	185	...	...	...	...	...	185
New Mexico.....	1,387	1,129	260	2	2,778	490	429	70	25	1,014	4,011
New York.....	349	79	79	...	507	219	27	1	45	292	799
North Carolina.....	4,825	3,145	1,142	285	9,397	2,339	1,739	136	278	4,492	13,557
North Dakota.....	1,212	561	94	168	2,035	...	...	...	...	...	2,035
Ohio.....	129	177	20	...	326	2	1	...	4	63	393
Oklahoma.....	1,295	1,196	507	1	2,999	132	110	8	503	753	3,792
Oregon.....	294	365	116	...	775	66	9	22	...	97	872
Pennsylvania.....	209	250	38	...	537	...	...	...	4	4	561
Rhode Island.....	1,644	1,470	610	3	3,727	616	442	18	32	1,108	4,915
South Carolina.....	229	192	30	...	451	32	15	...	47	94	588
South Dakota.....	110	131	51	341	633	20	29	...	49	...	682
Tennessee.....	112	119	...	86	317	20	2	6	...	28	345
Texas.....	317	394	226	2	939	10	5	...	15	...	954
Utah.....	827	822	60	4	1,733	56	25	...	255	336	2,069
Vermont.....	...	...	...	...	...	20	10	...	21	51	51
Virginia.....	53	54	...	...	107	1	...	...	...	70	178
Washington.....	369	395	61	334	1,159	134	78	...	212	...	1,371
West Virginia.....	351	302	56	31	740	301	115	192	...	608	1,348
Wisconsin.....	331	344	60	...	735	7	...	...	7	...	742
Wyoming.....	846	533	124	...	1,823	144	18	1	5	168	1,991
Totals.....	27,322	23,176	6,302	2,753	59,553	10,003	5,770	732	2,731	19,236	79,679

federal sanatoriums have x-ray departments, also sixty-eight state sanatoriums, 166 county, nineteen city, twelve city-county and 126 private. Three hundred and three indicated that physicians were in charge of the x-ray departments. Reference to table 24 will show that of the x-ray services in the

tuberculosis departments, where 509 physicians were reported in charge. In the group of tuberculosis departments are 412 general hospitals that have roentgenologic equipment, eighty-six mental institutions, eighteen tuberculosis-isolation hospitals, eight orthopedic services and forty-three other departments.

In 1935 there were 346 sanatoriums that performed sputum examinations, 349 had facilities for blood counts and 378 had equipment for urinalysis. In the present survey 364 sanatoriums reported laboratory depart-

Community service in the form of outpatient tuberculosis clinics is now provided in 264 sanatoriums and 259 tuberculosis departments. Nineteen of the sanatoriums and thirteen of the departments report traveling or field clinics, yet it is not certain from the data supplied that the field clinics of the departments are in all instances associated with the tuberculosis service. Ten federal sanatoriums conduct tuberculosis clinics, forty-eight state, 126 county, nine municipal, nine city-county and sixty-two private sanatoriums.

NURSING PERSONNEL IN TUBERCULOSIS SANATORIUMS

Four hundred and fifty sanatoriums representing 69,330 beds and an average daily census of 60,511 reported 5,054 registered nurses employed, 1,223

unregistered nurses, 673 students and 4,389 attendants. Practical nurses are apparently included in both the unregistered and the attendant groups.

Further reference should be made to tables 25 and 26 showing nursing personnel in the tuberculosis sanatoriums classified by states and according to control. The number of nurses and attendants has also been included in the list of sanatoriums accompanying this report. The employment of students, including affiliates and postgraduate nurses, was reported by the following sanatoriums:

1. Arroyo-Del Valle Sanatorium, Livermore, Calif.
2. Barlow Sanatorium, Los Angeles.
3. Pauling Rest Home, San Fernando, Calif.
4. Santa Clara County Sanatorium, San Jose, Calif.
5. Expatriates' Tubercular Home, Denver.
6. Wildwood Sanatorium, Hartford, Conn.
7. William Wirt Winchester Hospital, West Haven, Conn.
8. The Outlook, Urbana, Ill.
9. Broadlawns, Polk County Public Hospital (Tuberculosis Department), Des Moines, Iowa.
10. Bangor Sanatorium, Bangor, Me.
11. Maryland Tuberculosis Sanatorium, Henryton, Md.
12. Maryland Tuberculosis Sanatorium, State Sanatorium, Md.
13. Hospital for Consumptives, Towson, Md.
14. Sanatorium Division of Boston City Hospital, Boston.
15. Rutland State Sanatorium, Rutland, Mass.
16. Rutland Training Center, Rutland, Mass.
17. Plymouth County Hospital, South Hanson, Mass.
18. Glen Lake Sanatorium, Oak Terrace, Minn.
19. Pokegama Sanatorium, Pokegama, Minn.
20. Mississippi State Tuberculosis Sanatorium, Sanatorium, Miss.
21. Mount St. Rose Sanatorium, St. Louis.
22. Hospital for the Tuberculous, Kearney, Neb.
23. Lakeland Sanatorium, Grenloch, N. J.
24. Hermann M. Biggs Memorial Hospital, Ithaca, N. Y.
25. Homer Folks Tuberculosis Hospital, Oneonta, N. Y.
26. Sea View Hospital, Staten Island, N. Y.
27. North Carolina Sanatorium for the Treatment of Tuberculosis, Sanatorium, N. C.
28. Hamilton County Tuberculosis Sanatorium, Cincinnati.
29. Eastern Oregon State Tuberculosis Hospital, The Dalles, Ore.
30. Beaver County Sanatorium, Monaca, Pa.
31. White Haven Sanatorium, White Haven, Pa.
32. State Tuberculosis Sanatorium, Sanatorium, Texas.
33. Piedmont Sanatorium, Burkeville, Va.
34. Catawba Sanatorium, Catawba Sanatorium, Va.
35. Blue Ridge Sanatorium, Charlottesville, Va.
36. King County Tuberculosis Hospital, Seattle, Wash.
37. Laurel Beach Sanatorium, Seattle, Wash.
38. Riverton Sanatorium, Seattle, Wash.
39. Muirdale Sanatorium, Wauwatosa, Wis.

HOSPITALIZATION OF CHILDREN

The survey of 1935 showed a total of 11,647 beds for children: 9,036 in the sanatoriums, 944 in the tuberculosis departments and 1,667 in the preventoriums.

Table 19.—Average Length of Stay in Tuberculosis Sanatoriums According to Control

Control	Patients Treated	Treatment Days	Average Stay (1938)	Average Stay (1934)
Federal.....	9,037	1,245,015	138	172
State.....	39,913	6,763,925	170	166
County.....	42,243	7,221,890	171	173
City.....	16,603	2,905,400	175	170
City-County.....	4,675	723,175	156	165
Private.....	23,890	3,500,715	147	151
	136,361	22,370,120	164	166

These figures are nearly identical with the present report of 11,717 beds, including 2,144 in the regular preventoriums, 8,285 in the sanatoriums and 1,288 in the tuberculosis departments. In all there were 169 sanatoriums, eighty-one tuberculosis departments and thirty-one preventoriums that reported beds available for the care of children. Included in the present bed capacity for children are 657 in federal hospitals, 2,467 in private institutions and 8,593 in the remaining tax-supported hospitals: state 3,014, county 3,570, municipal 1,308 and city-county 701. A similar classification of

beds in the sanatoriums, tuberculosis departments and preventoriums can be found in tables 27 and 28.

From the standpoint of bed capacity alone, it would appear that the tuberculosis service for children has remained practically unchanged. Reference to the pres-

Table 20.—Average Length of Stay in Tuberculosis Sanatoriums by States

State	Patients Treated	Treatment Days	Average Stay
Alabama.....	784	91,250	116
Arizona.....	1,887	171,185	123
Arkansas.....	1,065	255,135	133
California.....	8,937	1,504,895	167
Colorado.....	1,778	346,020	194
Connecticut.....	2,890	502,100	194
Delaware.....	285	63,145	221
District of Columbia	1,046	187,075	180
Florida.....	1,391	179,945	129
Georgia.....	1,395	197,465	141
Idaho.....	280	45,625	163
Illinois.....	6,949	1,154,860	166
Indiana.....	3,286	477,420	145
Iowa.....	1,524	276,070	181
Kansas.....	920	154,395	167
Kentucky.....	2,465	336,520	126
Louisiana.....	619	89,000	137
Maine.....	959	165,710	172
Maryland.....	2,797	443,840	153
Massachusetts.....	5,897	1,119,455	190
Michigan.....	6,469	1,139,530	176
Minnesota.....	3,323	650,795	195
Mississippi.....	633	101,835	160
Missouri.....	3,627	589,810	167
Montana.....	409	74,005	181
Nebraska.....	305	50,210	164
New Hampshire.....	362	69,350	191
New Jersey.....	6,208	1,057,040	170
New Mexico.....	1,146	179,580	157
New York.....	20,721	3,499,255	169
North Carolina.....	5,768	767,960	133
North Dakota.....	619	114,245	184
Ohio.....	6,567	1,109,965	169
Oklahoma.....	2,274	290,905	128
Oregon.....	1,115	197,465	177
Pennsylvania.....	8,210	1,405,980	171
Rhode Island.....	831	182,865	220
South Carolina.....	1,651	253,675	154
South Dakota.....	574	90,885	153
Tennessee.....	1,918	346,750	180
Texas.....	6,060	619,010	102
Vermont.....	272	40,150	147
Virginia.....	2,819	412,085	146
Washington.....	1,614	252,945	157
West Virginia.....	1,411	306,600	217
Wisconsin.....	4,140	723,905	176
Wyoming.....	81	9,490	117
Totals.....	136,361	22,370,120	164

ent census reports, however, will show that the annual admissions have decreased 2,123 since the previous survey, when the sanatoriums admitted 10,394 children, the tuberculosis departments 1,031 and the preventoriums 4,098. From the reports of 251 sanatoriums,

Table 21.—Waiting List in Tuberculosis Institutions

	Sanatoriums		Departments		Totals	
	Vacancies	Waiting List	Vacancies	Waiting List	Vacancies	Waiting List
Indian Administration.....	235	137	245	42	480	179
Veterans Bureau.....	234	90	706	165	940	255
Other Federal.....	50	...	538	...	588	...
State.....	2,177	4,992	2,277	114	4,454	5,106
County.....	2,685	1,025	1,127	273	3,812	1,308
City.....	478	297	283	599	761	896
City-County.....	193	291	149	25	342	316
Private.....	3,537	759	752	159	4,289	918
Totals.....	9,577	7,572	6,577	1,225	16,254	8,796

167 tuberculosis departments and thirty-one preventoriums that accepted children for hospital care in 1935 it can be shown that a total of 13,400 children were admitted, 21,324 treated and 12,172 discharged. At the beginning of the year there were 7,924 patients pres-

ent; however, the average daily census was only 6,838. Admissions classified by control show the following distribution: federal 1,034, state 2,981, county 3,383, city 1,406, city-county 788, private 3,808. Similar data concerning the number of patients treated and the average daily census are included in table 28.

The sanatoriums admitted 8,332 children, discharged 7,500, treated 14,634 and maintained an average daily census of 5,382. The census at the beginning of the year was 6,302, at the end of the twelve months period 5,789. In the tuberculosis departments there were

of the sanatoriums that admit children. A total of 161 sanatoriums accepted "childhood" tuberculosis in 1934. In reporting on the condition of patients on admission, the sanatoriums listed 5,396 under the first infection type, the tuberculosis departments 685. It should be taken into consideration that adults with the first infection type are also included in these figures.

In recent years a number of institutions have discontinued their preventorium units in order to expand the regular sanatorium service. This would seem a logical procedure in view of the fact that the isolation of

Table 22.—Condition of Patients on Admission

State	Sanatoriums							Departments						
	Number Reporting	First Infection	Minimal	Moderately Advanced	Far Advanced	Non-Pulmonary	Other	Total	Number Reporting	First Infection	Minimal	Moderately Advanced	Far Advanced	Non-Pulmonary
Alabama.....	6	15	30	206	283	7	8	549	2	1	10	40	70	6
Arizona.....	13	148	147	293	247	10	73	974	10	13	4	103	353	12
Arkansas.....	2	233	89	51	454	10	4	846	3	..	3	2	74	..
California.....	32	306	409	1,343	1,862	84	316	4,310	26	95	175	701	632	92
Colorado.....	12	33	64	155	380	20	103	700	10	17	46	223	181	23
Connecticut.....	8	36	141	340	666	59	97	1,339	3	4	5	3	8	3
Delaware.....	2	4	13	35	52	1	0	114	..	..	..	..	..	..
District of Columbia.....	1	96	52	133	322	0	8	620	3	13	60	271	426	38
Florida.....	4	33	41	93	478	6	38	689	7	14	10	90	103	3
Georgia.....	4	45	57	207	450	96	61	916	3	..	2	21	62	1
Idaho.....	1	153	22	24	4	8	..	213	3	4	11	24	12	..
Illinois.....	24	130	351	594	2,056	495	262	3,888	14	22	104	330	1,484	44
Indiana.....	10	292	222	331	738	76	200	1,839	5	..	11	54	120	..
Iowa.....	6	15	79	149	395	44	41	723	4	..	6	13	7	..
Kansas.....	2	11	21	84	140	1	126	383	7	4	45	79	83	9
Kentucky.....	4	156	50	317	920	52	24	1,519	6	21	10	63	29	10
Louisiana.....	4	18	31	76	183	23	6	337	5	..	158	580	672	183
Maine.....	4	39	43	86	227	9	81	485	5	4	28	20	20	3
Maryland.....	6	111	270	401	654	22	63	1,521	3	1	1	24	7	6
Massachusetts.....	20	138	228	619	1,256	228	217	2,686	19	26	67	214	313	141
Michigan.....	25	130	408	952	1,568	150	295	3,512	14	62	305	623	1,034	128
Minnesota.....	14	44	122	243	567	36	75	1,087	10	16	91	238	360	121
Mississippi.....	2	2	28	46	145	2	100	323	2	3	1	4	..	..
Missouri.....	6	12	134	342	1,318	17	197	2,020	9	15	44	110	276	14
Montana.....	1	6	50	61	50	5	36	208	4	6	6	55	38	17
Nebraska.....	1	19	42	32	73	6	3	175	5	2	6	30	57	14
Nevada.....	..	..	..	..	..	..	..	..	2	9	..	12	8	..
New Hampshire.....	2	21	31	50	73	2	..	177	..	..	..	..	..	..
New Jersey.....	17	230	270	726	1,599	130	589	3,754	14	21	77	466	553	81
New Mexico.....	7	49	118	181	278	31	21	678	8	21	40	167	487	25
New York.....	57	493	1,338	3,179	4,710	443	1,252	11,415	42	170	471	1,766	2,702	250
North Carolina.....	15	100	176	520	830	75	59	1,760	2	..	3	4	2	..
North Dakota.....	1	10	68	76	95	12	32	293	4	..	1	11	10	13
Ohio.....	20	583	702	1,495	1,577	100	159	4,016	16	52	100	367	748	143
Oklahoma.....	4	182	145	210	612	49	169	1,394	6	23	9	139	183	4
Oregon.....	3	61	62	157	149	13	34	476	1	..	..	2	2	..
Pennsylvania.....	16	504	491	689	1,823	215	368	4,090	19	6	56	267	512	50
Rhode Island.....	1	6	46	102	144	23	16	337	2	..	27	49	62	4
South Carolina.....	5	25	65	120	221	18	12	461	2	6	5	32	27	..
South Dakota.....	1	2	22	43	52	..	19	133	4	..	9	45	44	21
Tennessee.....	5	171	75	357	296	22	49	970	4	..	14	55	63	22
Texas.....	14	399	579	1,326	718	137	17	3,176	6	8	48	154	322	53
Utah.....	..	..	..	..	..	..	..	..	1	..	1	18	23	1
Vermont.....	2	..	9	45	71	27	13	165	1	..	..	1	..	..
Virginia.....	7	74	154	334	716	47	47	1,374	7	3	11	63	70	3
Washington.....	0	25	87	263	292	19	63	749	10	20	175	202	136	18
West Virginia.....	5	39	32	87	300	22	34	514	1	..	..	..	77	5
Wisconsin.....	21	179	256	641	882	127	111	2,196	7	1	78	243	400	34
Wyoming.....	1	..	4	5	37	12	..	58	4	..	4	15	6	2
Totals.....	427	5,396	7,964	17,727	31,173	3,051	5,532	70,845	345	685	2,337	8,013	12,872	1,627

1,764 children admitted, 2,496 treated and 1,368 discharged. The census averaged 566. It was 710 on the first day of the year, 640 on the last day. The preventoriums, which had a daily census of 890, admitted 3,304 and treated 4,194.

The institutions classified as preventoriums furnish less than half of the facilities now devoted to preventorium care. They have 2,144 beds, whereas the sanatoriums provide 2,447 and the tuberculosis departments 239. Accordingly there are at present 4,830 beds for preventorium purposes in thirty-one regular preventoriums, fifty-five sanatoriums and thirteen tuberculosis departments. It is apparent that additional preventorium beds are available, however, since patients with the first infection type of disease were reported in 167

patients with open pulmonary tuberculosis has proved a more effective means of tuberculosis prevention and control than the hospitalization of tuberculous contacts and children with the first infection type of disease.

FEDERAL SANATORIUMS AND DEPARTMENTS

Included in the federal classification are forty-five tuberculosis institutions of the Indian Administration, eighteen Army hospitals, seven Naval hospitals, twenty under the control of the U. S. Public Health Service, fifty assigned to the U. S. Veterans Bureau and nine other federal departments. In all there are nineteen sanatoriums, 129 tuberculosis departments and one preventorium with a total capacity of 9,076 beds. The sanatoriums have 3,970 beds, the tuberculosis depart-

ments 5,026 and the preventoriums eighty. This is a decrease of 1,864 since 1935, when eighteen sanatoriums and 151 departments reported a combined capacity of 10,940 beds, including 328 for children. At present there are 657 beds for children with all but six assigned

toriums are in operation at present, thirty-two tuberculosis departments and one preventorium. These have a capacity of 1,609 including 651 beds for children. The Sioux Sanatorium, Rapid City, S. D., has been added to the list since the previous survey, and the Kayenta

Table 23.—Diagnostic and Therapeutic Facilities Classified by States

State	Sanatoriums								Departments							
	Pneumothorax		Tuberculosis Clinics		X-Ray Departments		Laboratory Departments		Pneumothorax		Tuberculosis Clinics		X-Ray Departments		Laboratory Departments	
	In-patient	Out-patient	Yes	Field	Yes	M.D.	Yes	M.D.	In-patient	Out-patient	Yes	Field	Yes	M.D.	Yes	M.D.
Alabama.....	6	6	5	1	7	4	2	2	6	4	7	1	12	11	12	11
Arizona.....	13	8	3	2	10	6	8	3	8	5	5	1	7	6	7	5
Arkansas.....	2	2	2	..	2	2	2	2	1	1	..	..	2	2	3	2
California.....	24	24	17	1	30	25	28	20	31	26	30	..	40	36	37	32
Colorado.....	15	7	6	..	10	6	10	7	5	5	6	1	12	9	12	9
Connecticut.....	7	7	5	..	8	7	7	6	4	2	..	..	4	4	5	3
Delaware.....	2	2	1	..	1	1	1	1	..	..	..	..	2	2	2	2
Dist. of Columbia.....	1	..	..	..	1	1	1	1	4	2	4	..	9	9	9	9
Florida.....	3	2	1	..	2	1	2	1	12	7	6	..	14	14	14	10
Georgia.....	4	1	3	1	4	1	4	1	3	2	3	..	5	5	5	4
Idaho.....	1	1	..	..	1	1	1	1	2	2	1	..	4	3	4	3
Illinois.....	26	22	21	..	26	20	21	11	10	5	5	..	23	19	23	19
Indiana.....	10	10	7	1	10	8	9	7	3	3	4	..	6	4	6	5
Iowa.....	6	6	4	..	6	5	6	3	5	4	4	..	12	10	10	7
Kansas.....	3	2	1	..	1	..	2	1	5	3	7	..	11	11	10	10
Kentucky.....	5	5	2	1	4	3	4	3	6	4	5	..	12	9	12	9
Louisiana.....	4	2	2	..	5	4	4	3	5	4	5	..	5	5	5	4
Maine.....	4	4	3	..	4	4	4	2	4	2	3	..	7	6	7	9
Maryland.....	7	7	4	..	6	5	6	5	6	2	2	..	8	8	10	9
Massachusetts.....	20	16	18	..	20	15	18	14	14	10	9	..	24	22	23	20
Michigan.....	25	22	16	..	24	10	20	15	15	10	7	2	25	22	24	20
Minnesota.....	15	15	10	4	15	14	13	10	8	5	6	..	15	14	14	13
Mississippi.....	1	1	2	1	1	1	2	2	2	1	5	..	17	11	16	9
Missouri.....	6	4	3	..	6	5	6	5	8	6	5	..	18	17	16	14
Montana.....	1	1	..	..	1	..	1	..	4	2	4	1	7	7	7	7
Nebraska.....	1	1	..	..	1	1	1	1	4	3	3	1	7	6	7	6
Nevada.....	..	..	..	..	..	..	..	..	..	..	1	1	2	1	1	1
New Hampshire.....	2	2	2	..	2	2	2	2	1	1	..	..	1	1	1	1
New Jersey.....	17	16	10	1	15	8	14	7	19	9	8	1	20	20	20	20
New Mexico.....	7	4	4	..	6	6	6	3	6	4	6	1	10	10	10	10
New York.....	55	44	38	5	53	47	43	36	39	23	26	..	56	54	67	65
North Carolina.....	18	15	8	..	14	10	9	3	2	2	3	..	6	5	6	4
North Dakota.....	1	1	1	..	1	1	1	1	4	4	4	..	7	6	6	6
Ohio.....	20	18	15	..	22	15	22	12	16	8	9	..	25	19	24	18
Oklahoma.....	5	5	4	..	4	3	4	2	6	5	5	..	9	6	9	5
Oregon.....	4	2	2	..	3	1	3	1	1	1	1	..	3	3	3	2
Pennsylvania.....	16	14	7	..	15	11	13	9	17	10	10	..	33	32	35	32
Rhode Island.....	1	1	1	..	1	..	1	..	1	1	2	..	2	2	2	2
South Carolina.....	5	4	2	..	4	2	4	1	2	2	2	..	3	3	3	3
South Dakota.....	2	2	1	..	2	2	2	1	2	2	4	..	5	4	5	5
Tennessee.....	6	5	4	..	6	4	5	2	5	4	4	1	11	11	9	8
Texas.....	16	12	2	..	12	9	12	5	9	7	10	..	16	13	15	12
Utah.....	..	..	..	..	..	..	..	..	2	1	1	..	4	4	4	4
Vermont.....	2	2	2	..	2	2	2	1	..	..	2	..	1	1	1	1
Virginia.....	8	6	5	..	8	5	6	1	6	2	5	1	10	10	11	9
Washington.....	9	9	6	..	9	6	8	5	7	7	8	..	17	15	16	14
West Virginia.....	5	4	1	..	4	3	3	2	2	2	3	..	4	4	4	4
Wisconsin.....	20	16	12	..	20	7	20	4	6	5	8	1	13	12	13	11
Wyoming.....	1	1	1	1	1	..	1	..	..	..	2	..	4	4	3	3
Totals.....	442	361	264	19	410	303	364	224	323	222	259	13	563	509	558	479

Table 24.—Diagnostic and Therapeutic Facilities Classified by Control

Control	Sanatoriums								Departments							
	Pneumothorax		Tuberculosis Clinics		X-Ray Departments		Laboratory Departments		Pneumothorax		Tuberculosis Clinics		X-Ray Departments		Laboratory Departments	
	In-patient	Out-patient	Yes	Field	Yes	M.D. In Charge	Yes	M.D. In Charge	In-patient	Out-patient	Yes	Field	Yes	M.D. In Charge	Yes	M.D. In Charge
Federal.....	19	18	10	2	19	18	19	12	74	55	79	6	124	116	121	117
State.....	67	57	48	7	68	47	65	35	59	19	37	2	102	81	105	76
County.....	173	158	126	9	166	127	145	92	43	34	31	2	50	42	48	23
City.....	18	13	9	..	19	16	13	10	44	30	27	..	54	53	51	47
City-County.....	14	11	9	..	12	6	11	4	4	4	2	..	6	5	6	5
Private.....	151	104	62	1	125	89	111	68	101	61	79	3	228	209	221	178
Totals.....	442	361	264	19	410	303	364	224	323	222	259	13	563	509	558	479

to the Indian Service. As shown in table 29, the federal institutions admitted 14,900 patients in 1938, treated 21,883 and maintained an average daily census of 6,703. The former report showed an admission rate of 15,523.

In 1935 the Indian Administration reported eleven sanatoriums and forty-one tuberculosis departments with a total capacity of 1,471 beds. Twelve sana-

Sanatorium, Kayenta, Ariz., was transferred from the departments to the sanatorium classification. However, the Fort Defiance Sanatorium, Fort Defiance, Ariz., became a unit of the Navajo General Hospital and was accordingly listed as a department. Although the bed capacity has increased, the scope of the clinical service remains practically unchanged. The admissions, totaling 2,626, are almost identical with the report of 1935.

but the average daily census has increased from 1,028 to 1,185. There were 3,644 patients treated with 116 days as the average length of stay. Vacancies totaled 480, patients on the waiting list 180. Thirty-nine of the institutions in this group report x-ray departments,

Table 25.—Nursing Personnel in Tuberculosis Sanatoriums Classified by States

State	Number Reporting	Average Census	Registered Nurses	Other Graduates	Training Schools	Students	Attendants
Alabama.....	6	199	23	8	..	..	12
Arizona.....	13	397	49	7	..	..	63
Arkansas.....	2	699	14	98	..	..	36
California.....	37	4,103	425	18	4	48	390
Colorado.....	13	921	39	36	1	2	55
Connecticut.....	8	1,540	317	16	12	245	80
Delaware.....	2	173	16	..	..	..	24
District of Columbia.....	1	615	58	..	..	..	..
Florida.....	5	478	44	20	..	..	25
Georgia.....	4	541	22	4	..	..	47
Idaho.....	1	123	8	..	..	..	6
Illinois.....	27	3,164	223	23	1	4	210
Indiana.....	10	1,308	67	28	..	..	116
Iowa.....	6	758	30	7	1	2	73
Kansas.....	4	423	12	4	..	..	6
Kentucky.....	4	922	66	3	..	..	155
Louisiana.....	5	244	13	1	..	..	31
Maine.....	4	454	45	8	1	1	17
Maryland.....	6	1,207	12	71	3	73	114
Massachusetts.....	20	3,053	343	36	4	18	335
Michigan.....	25	3,122	315	44	..	..	240
Minnesota.....	15	1,783	170	43	2	17	106
Mississippi.....	4	279	45	..	1	14	3
Missouri.....	6	1,616	107	3	1	2	312
Montana.....	1	203	22	2	..	..	9
Nebraska.....	1	154	4	1	1	13	..
New Hampshire.....	2	190	13	7	..	..	6
New Jersey.....	17	2,896	273	40	1	2	192
New Mexico.....	7	492	38	6	..	..	42
New York.....	55	9,317	971	332	3	27	483
North Carolina.....	19	2,062	158	26	1	44	163
North Dakota.....	1	313	17	5	..	..	22
Ohio.....	19	2,993	252	12	1	5	246
Oklahoma.....	5	797	22	3	..	..	65
Oregon.....	4	541	46	8	1	3	28
Pennsylvania.....	16	3,832	224	56	2	17	180
Rhode Island.....	2	501	43	1	..	..	57
South Carolina.....	5	673	49	10	..	..	65
South Dakota.....	2	249	27	12	..	..	19
Tennessee.....	5	950	48	39	..	..	55
Texas.....	16	1,651	29	65	1	57	55
Vermont.....	2	110	8	..	..	..	8
Virginia.....	8	1,129	31	47	3	63	26
Washington.....	8	576	67	4	3	9	22
West Virginia.....	6	816	48	39	..	..	55
Wisconsin.....	20	1,856	197	30	1	7	131
Wyoming.....	1	26	4	..	..	..	..
Totals.....	430	60,511	5,034	1,223	39	673	4,389

ments. Formerly there were 783 beds available in one sanatorium and twenty-five departments. An increase occurred in the number of admissions and also in the average daily census. Admissions totaled 1,002 and the average occupancy 585 as compared to 738 and 398 in 1934. X-ray and laboratory facilities are furnished in all the institutions in this group. Seventeen have pneumothorax equipment and twelve indicate that collapse therapy is made available to outpatients.

In the Veterans hospitals there has been a considerable decrease in the number of beds for tuberculosis. While the previous report showed six sanatoriums and fifty-nine tuberculosis departments with a capacity of 7,734 beds, the present survey reveals only 5,671 in forty-four departments and six hospitals that limit their service to tuberculosis. The sanatoriums have 2,713 beds, the tuberculosis departments 2,958. There has also been a decrease in the number of admissions from 10,493 to 9,099. On the other hand the reports indicate an increase in the average daily occupancy when compared with the data supplied in 1934. All the Veterans hospitals included in this study have x-ray and laboratory departments, thirty-six have pneumothorax equipment and thirty provide facilities for outpatient pneumothorax service.

There are nine other federal hospitals that report 216 beds for tuberculosis, 279 admissions and an average daily census of 111. These institutions also have x-ray and laboratory facilities and four furnish equipment for collapse therapy.

STATE SANATORIUMS

At present there are seventy-two state sanatoriums with a total capacity of 21,066 beds: 18,203 for adults and 2,863 for children, including 656 preventorium beds. This represents a net increase of seven institutions and 3,758 beds since the report of 1935. With the addition of new institutions in Arizona, Florida, New Mexico and Utah there are now forty states that own and operate sanatoriums for the treatment of tuberculosis. In Kansas, Michigan, North Carolina and Texas new units have also been added to supplement previous facilities, whereas in Oklahoma a change in service

Table 26.—Nursing Personnel in Tuberculosis Sanatoriums Classified by Control

Control	Number Reporting	Average Census	Registered Nurses	Other Graduates	Training Schools	Students	Attendants
Indian Administration.....	12	840	81	12	..	..	105
U. S. Public Health Service.....	1	173	10	..	..	..	14
Veterans Bureau.....	6	2,398	281	..	..	..	378
State.....	71	18,504	1,173	382	12	274	1,252
County.....	177	19,375	1,734	356	13	87	1,423
City.....	20	7,900	963	116	1	18	451
City-County.....	15	1,973	92	40	..	..	173
Private.....	148	9,288	720	317	13	294	593
Totals.....	450	60,511	5,034	1,223	39	673	4,389

thirty-six have laboratory units and twenty-four provide pneumothorax equipment.

In the previous survey, thirteen hospitals of the U. S. Army reported 630 beds for tuberculosis and 1,197 admissions. At present there are eighteen tuberculosis departments, 617 beds and an annual admission rate of 1,817. Information concerning the average daily occupancy is incomplete, however, but the census at the beginning of the year was 446. All these hospitals have x-ray and laboratory departments, and five supply facilities for the administration of pneumothorax.

Naval hospitals report seven tuberculosis departments, 152 beds for tuberculosis, 177 admissions and an average daily census of 100. All indicate that facilities are available for pneumothorax and laboratory and x-ray service. In 1935 there were ten tuberculosis departments, 176 beds and 351 admissions in this group.

In the hospitals of the United States Public Health Service there are 811 beds for tuberculosis: 244 in a sanatorium and 567 in nineteen tuberculosis depart-

necessitated the reclassification of one of the state sanatoriums as a tuberculosis department. The additions to the list include the State Welfare Sanatorium, Tempe, Ariz., the Florida State Sanatorium, Orlando, Fla., Kenney Memorial Hospital, Norton, Kan., Northern Michigan Tuberculosis Sanatorium, Gaylord, Mich., State Tuberculosis Sanatorium, Socorro, N. M., Western North Carolina Sanatorium, Black Mountain,

N. C., Kerrville State Sanatorium, Kerrville, Texas, and the Utah State Tuberculosis Sanatorium, Ogden, Utah. The Soldiers' Tubercular Sanatorium, Sulphur, Okla., was transferred from the sanatorium to the department list.

As shown in table 30, the state sanatoriums admitted 21,917 patients: 18,173 adults, 2,716 children and 1,028 unclassified. A total of 39,986 patients were treated during the year. At the end of the twelve months period there were 18,889 patients under treatment and

At present there are eighty-five sanatoriums and hospitals approved for residencies in tuberculosis. These include fifteen state sanatoriums, as indicated by the plus sign (+) in the accompanying list of tuberculosis institutions.

COUNTY SANATORIUMS

The county sanatoriums, now constituting the largest group of tuberculosis institutions, show a net increase of ten since the previous survey. Seventeen institutions have been added to the list, six have been discontinued

Table 27.—Hospital Facilities for Children Classified by States

State	Sanatoriums		Departments		Preventoriums		Total Beds	Children Admitted				Number Treated				Average Census				
	Preventorium Beds	Total Beds for Children	Preventorium Beds	Total Beds for Children	Bed Capacity	For Preven- torium Care		Total Beds for Children	Sanatoriums	Departments	Preventoriums	Total	Sanatoriums	Departments	Preventoriums	Total	Sanatoriums	Departments	Preventoriums	Total
Alabama.....	12	3	5	3	17	17	17	17	33	185	409	253	33	185	471	12	1	1	12	
Arizona.....	70	126	16	130	200	272	272	191	33	266	266	366	33	266	366	85	1	1	85	
Arkansas.....	95	206	20	241	394	620	1,170	478	171	301	950	982	351	461	1,794	491	63	100	719	
California.....	49	76	24	34	70	130	130	63	11	74	119	12	119	131	7	4	11	11		
Colorado.....	427	10	46	24	34	70	70	96	5	101	396	5	101	401	333	33	20	20	333	
Connecticut.....	10	300	6	25	47	51	51	13	15	28	45	16	35	80	23	1	1	23	23	
Delaware.....	22	22	4	15	166	190	190	30	3	137	170	30	4	137	171	22	1	1	22	
District of Columbia.....	151	175	15	166	190	190	190	98	..	98	246	..	..	246	30	..	..	30	30
Florida.....	66	132	..	66	132	132	132	203	2	205	280	2	205	282	125	1	..	125	125	
Georgia.....	73	183	14	48	121	245	245	611	18	100	729	782	30	100	912	138	10	..	148	
Idaho.....	25	142	..	25	142	142	142	315	3	318	438	6	318	444	97	..	..	97	97
Illinois.....	55	12	12	..	67	65	65	10	..	75	98	10	..	108	30	..	..	30	30
Indiana.....	10	44	6	10	50	151	10	161	185	12	161	185	12	197	34	2	..	34	34	
Iowa.....	120	125	1	120	126	159	6	165	269	6	269	6	269	275	110	..	..	110	110
Kansas.....	16	16	..	16	16	16	16	18	148	166	25	148	166	173	11	..	..	11	11
Kentucky.....	56	..	..	..	56	37	..	37	..	37	66	3	..	69	20	3	..	23	23
Louisiana.....	194	..	..	..	194	185	3	188	398	3	401	398	3	401	208	..	..	208	208
Maine.....	630	32	30	185	167	704	704	267	46	306	639	753	56	358	1,167	355	7	52	414	
Maryland.....	35	340	43	30	65	413	413	272	182	454	379	213	..	592	50	42	..	201	201	
Massachusetts.....	60	78	10	80	140	168	168	61	46	88	215	149	54	263	366	54	3	75	132	
Michigan.....	50	50	..	50	50	50	50	1	..	1	2	..	..	2	..	..	..	..	..
Minnesota.....	32	86	14	61	113	181	181	96	80	34	210	129	94	34	257	34	7	..	41	
Mississippi.....	10	2	9	2	19	19	19	11	24	35	21	27	..	48	10	4	..	14	14	
Missouri.....	33	..	..	..	33	24	..	24	..	24	52	3	..	55	23	..	..	23	23
Montana.....	..	..	..	..	..	..	..	..	22	22	22	..	27	27	18	..	..	18	18
Nebraska.....	25	..	..	..	25	20	..	20	..	20	43	..	..	43	318	71	219	608	608
Nevada.....	189	340	63	97	225	477	477	331	70	628	1,029	591	140	847	1,573	42	..	..	42
New Hampshire.....	81	..	5	..	86	82	16	98	161	17	161	17	..	178	960	139	63	1,167	1,167	
New Jersey.....	332	1,465	53	239	257	642	1,981	1,192	356	491	2,039	2,334	492	559	3,385	169	..	..	69
New Mexico.....	40	111	44	40	155	75	75	20	13	100	133	40	14	163	217	12	..	12	12	
New York.....	10	..	5	80	80	95	95	20	13	100	133	40	14	163	217	291	4	40	335	
North Carolina.....	100	456	10	27	100	210	538	509	41	295	845	1,016	49	335	1,400	63	23	..	91	
North Dakota.....	70	80	37	70	117	117	117	206	78	284	322	100	..	422	45	..	..	45	45
Ohio.....	36	36	1	36	37	39	..	39	..	39	77	..	..	77	634	5	80	719	719
Oklahoma.....	280	603	4	112	188	472	993	722	23	231	976	1,332	41	311	1,634	..	..	..	..
Oregon.....	82	..	68	68	150	16	3	125	144	46	3	163	217	51	127	3	..	129	129	
Pennsylvania.....	12	62	12	62	62	63	..	63	..	63	114	..	..	114	..	..	..	..	..
Rhode Island.....	..	..	..	..	..	4	24	28	4	30	4	30	..	34	127	3	..	129	129
South Carolina.....	263	1	50	50	316	205	23	77	305	431	23	77	531	80	..	..	..	..	..
South Dakota.....	236	246	..	236	246	568	8	576	648	8	648	8	..	656	..	..	..	..	..
Tennessee.....	..	..	..	..	..	..	..	..	3	3	..	..	..	3	..	..	70	70	70
Texas.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Utah.....	60	124	..	60	80	80	80	4	..	106	110	4	..	176	180	24	..	24	24	
Vermont.....	14	77	50	273	64	350	350	129	..	139	200	..	..	200	..	41	163	..	204
Virginia.....	30	90	2	32	96	78	3	85	225	310	141	417	..	553	77	..	..	77	77
Washington.....	53	154	1	134	187	259	259	206	36	85	327	330	37	85	432	66	..	..	66
West Virginia.....	..	..	..	..	..	..	..	..	3	3	..	..	4	4	..	..	..	..	..
Wisconsin.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wyoming.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals.....	2,417	8,285	239	1,288	2,144	4,830	11,717	8,332	1,764	3,291	13,400	14,634	2,496	4,191	21,321	6,382	566	890	6,838	

a waiting list of 4,992 in comparison to 2,177 vacancies. The average daily census was 18,448, the average length of stay 170.

Facilities for pneumothorax are now available in sixty-seven of the state sanatoriums, and fifty-seven have made arrangements for collapse therapy in the outpatient department. Sixty-eight have x-ray equipment, sixty-five provide laboratory facilities and forty-eight conduct tuberculosis clinics. Field clinics are also sponsored by seven of the institutions in this group.

The nursing personnel consists of 1,173 registered nurses, 382 other graduates, 274 students and 1,252 attendants. The student nurses are distributed in twelve training schools.

and one has been reclassified as a tuberculosis department. The additions include the Morgan County Tuberculosis Sanatorium, Flint, Ala.; Batson Memorial Sanatorium, Lafayette, Ala.; Pauling Rest Home, San Fernando, Calif.; San Luis Obispo County Tuberculosis Sanatorium, San Luis Obispo, Calif.; Lake County Sanatorium, Waukegan, Ill.; Hillcrest Tuberculosis Hospital, Vincennes, Ind.; Kenton County Tuberculosis Hospital, Covington, Ky.; Ontonagon County Sanatorium, Rockland, Mich.; Jones County Cottage Sanatorium, Ellisville, Miss.; Hinds County Tuberculosis Sanatorium, Raymond, Miss.; Hudson County Tuberculosis Sanatorium, Jersey City, N. J.; Roosevelt Hospital, Metuchen, N. J.; Tuscarawas County

Sanatorium, New Philadelphia, Ohio; William Roche Memorial Tuberculosis Hospital, Toledo, Ohio; Erie County Tuberculosis Hospital, Erie, Pa.; Bexar County Tuberculosis Colony, Southton, Texas, and the Blue Mountain Sanatorium, Walla Walla, Wash.

The Pima County Hospital, Tucson, Ariz., is now listed under tuberculosis departments, whereas the following sanatoriums have discontinued their service: Maricopa County Tuberculosis Hospital, Phoenix, Ariz.; Bon Air Tuberculosis Sanatorium, Ontonagon, Mich.; Greene County Tuberculosis Sanatorium, Springfield, Mo.; Pleasant Valley Sanatorium, Bath, N. Y.; Tompkins County Tuberculosis Hospital, Trumansburg, N. Y., and the Lucas County Tuberculosis Hospital, Toledo, Ohio.

the outpatient departments. One hundred and twenty-six report tuberculosis clinics within the institution and it was also indicated that nine conduct an outpatient service in the field.

Registered nurses total 1,734, other graduates 356, student nurses eighty-seven and attendants 1,423. Thirteen of the sanatoriums in this group participate in the training of student nurses. It is also of interest to note that twenty-four county sanatoriums have been approved for residencies in tuberculosis.

MUNICIPAL SANATORIUMS

The District of Columbia and the states of Illinois, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania and Virginia have sanatoriums under

Table 28.—Hospital Facilities for Children Classified by Control

Control	Sanatoriums		Departments		Preventoriums		Total Beds		Children Admitted				Number Treated				Average Census			
	Preventorium Beds	Total Beds for Children	Preventorium Beds	Total Beds for Children	Bed Capacity	For Preven- torium Care	Total Beds for Children	Sanatoriums	Departments	Preventoriums	Total	Sanatoriums	Departments	Preventoriums	Total	Sanatoriums	Departments	Preventoriums	total	
Federal.....	136	319	...	258	80	216	657	519	415	100	1,034	760	628	163	1,551	240	173	63	476	
State.....	656	2,577	10	137	...	666	3,014	2,729	232	...	2,961	5,036	282	...	5,318	1,951	27	...	2,005	
County.....	1,050	2,706	96	374	490	1,636	3,570	2,569	401	413	3,383	4,928	733	460	6,130	2,005	226	56	2,287	
City.....	...	1,149	119	159	...	119	1,308	1,177	229	...	1,406	1,782	284	...	2,066	534	35	...	567	
City-County.....	309	436	...	135	130	439	701	594	29	165	788	919	73	240	1,232	186	43	75	304	
Private.....	296	798	14	225	1,444	1,754	2,467	744	438	2,626	3,808	1,269	496	3,322	5,027	436	62	696	1,394	
Totals.....	2,447	8,255	239	1,288	2,144	4,830	11,717	8,332	1,764	3,304	13,400	14,634	2,496	4,194	21,324	5,382	566	890	6,838	

Table 29.—Federal Tuberculosis Departments and Sanatoriums

Control	Admissions		Patients Treated		Average Daily Census		Patients Present		Pneumothorax	
	Sanatoriums		Sanatoriums		Sanatoriums		Sanatoriums		Sanatoriums	
	Number of Sanatoriums	Bed Capacity	Number of Departments	Bed Capacity	Number of Sanatoriums	Bed Capacity	Number of Departments	Bed Capacity	Number of Sanatoriums	Bed Capacity
Indian Administration.....	12	1,013	32	516	1,326	1,200	2,062	1,519	840	282
U. S. Public Health Service.....	...	...	18	617	...	1,817	...	2,263	...	42
Veterans Bureau.....	1	244	10	567	167	835	1,241	173	412	178
Other Federal.....	6	2,713	44	2,958	4,229	4,670	7,135	2,398	2,345	2,265
Totals.....	19	3,970	129	5,026	5,722	9,178	9,037	12,816	3,411	3,292

Indian Administration: 1 Preventorium, 80 beds; 100 admissions, 63 average census.

There are at present twenty-six states in which sanatoriums are operated under county control, the same number as reported in 1935. At that time, however, Arizona was included but not the state of Mississippi.

In table 31 it can be noted that 182 county sanatoriums provide 22,206 beds: 19,500 for adults and 2,706 for children. This represents an increase of 2,092 since the previous survey. Of the beds for children 1,050 are utilized for preventorium care. Admissions total 22,778, patients treated 42,243, the average daily census 19,481 and patients under treatment at the end of the year 19,521. The number of patients on the waiting list was 1,095, although vacancies totaled 2,685. In these institutions the average length of stay was 171 days.

One hundred and sixty-six of the county sanatoriums have x-ray departments, 145 have laboratory facilities and 173 provide pneumothorax equipment. Collapse therapy has also been extended into 158 of

municipal control. Since the previous survey, which showed twenty-two institutions in this group, there have been three sanatoriums added, four removed and one transferred to the list of tuberculosis departments. The additions include the Municipal Tuberculosis Home, North Riverside, Ill., the Rockford Municipal Sanatorium, Rockford, Ill., and the Cleveland Tuberculosis Sanatorium at Warrensville, Ohio, formerly classified as city-county institutions. Three institutions discontinued their service: the Health Department Hospital, Chicopee, Mass.; the Holyoke Tuberculosis Sanatorium, Holyoke, Mass., and the Convalescent Tuberculosis Hospital, Cleveland. The Tuberculosis Hospital, Washington, D. C., was also removed from the list, since it has now been combined with the Tuberculosis Sanatorium at Glenn Dale, Md. Formerly the Tuberculosis Department of Baltimore City Hospital was also included but has now been reclassified as a tuberculosis department.

Accordingly there are now twenty municipal sanatoriums in operation with a total capacity of 8,486 beds, including 1,149 beds for children. Reference to the corresponding section of the 1935 report will indicate that the bed capacity has increased by 1,121 even though the number of institutions has decreased.

The municipal sanatoriums admitted 8,993 patients, treated 16,603 and maintained an average daily census of 7,960. The average length of stay was 175 days. At the end of the twelve months period there were 8,008 patients under treatment, 207 on the waiting list and 478 vacancies.

Diagnostic and therapeutic facilities are provided as follows: x-ray departments nineteen, clinical labora-

however, so that there are still eleven states that have sanatoriums under city-county control. The additions to the list include the Escambia County Tuberculosis Sanatorium, Pensacola, Fla.; the Negro Tuberculosis Hospital, Jacksonville, Fla., and the Wake County Tuberculosis Sanatorium, Raleigh, N. C. Two sanatoriums formerly included in this group have been transferred to the municipal classification, namely the Rockford Municipal Sanatorium, Rockford, Ill., and the Sunny Acres, Cleveland Tuberculosis Sanatorium, Warrensville, Ohio.

The city-county sanatoriums have a total capacity of 2,191 beds, a decrease of 232 since the last report. There are 1,755 beds for adults and 436 for children,

Table 30.—State Sanatoriums Classified by States

State	Number Sanatoriums	Bed Capacity			Patients Admitted			Patients Treated	Average Census	Patients Present
		Adults	Children	Total	Adults	Children	Total			
Arizona.....	1	110	...	110	183	...	183	243	91	101
Arkansas.....	2	637	95	732	670	260	930	1,605	600	519
Connecticut.....	5	977	427	1,404	780	92	872	2,191	1,314	1,283
Delaware.....	2	154	46	200	101	13	114	285	173	171
Florida.....	1	318	...	318	467	1	468	784	313	316
Georgia.....	1	232	96	328	515	70	585	679	290	220
Indiana.....	1	250	...	250	129	47	223*	425	214	150
Iowa.....	1	420	...	420	291	...	291	642	389	400
Kansas.....	12	519	24	543	195	30	223	553	323	325
Kentucky.....	1	125	5	130	227	1	228	289	91	107
Louisiana.....	1	111	...	111	79	...	79	170	97	108
Maine.....	3	399	56	455	435	36	471	912	435	437
Maryland.....	4	886	146	1,032	1,168	120	1,288	2,239	950	1,000
Massachusetts.....	4	684	474	1,158	585	260	845	1,632	1,015	990
Michigan.....	3	840	80	920	577	45	622	1,310	717	760
Minnesota.....	1	480	...	480	421	47	468	516	381	387
Mississippi.....	1	400	50	450	307	1	308	533	254	273
Missouri.....	1	677	14	691	846	45	891	1,380	626	681
Montana.....	1	198	10	208	197	11	208	400	203	210
Nebraska.....	1	128	33	161	151	24	175	305	154	144
New Hampshire.....	1	140	...	140	74	...	74	170	107	103
New Jersey.....	1	384	110	494	346	83	429	882	416	475
New Mexico.....	1	65	...	65	65	...	65	122	58	65
New York.....	4	900	150	1,050	1,007	53	1,060	1,837	871	897
North Carolina.....	2	610	70	680	927	49	976	1,576	663	656
North Dakota.....	1	358	10	368	273	20	293	619	313	305
Ohio.....	1	257	...	257	273	132	405	616	211	226
Oklahoma.....	2	612	70	682	966	122	1,088	1,665	606	624
Oregon.....	2	489	36	525	314	36	350	827	459	502
Pennsylvania.....	3	1,698	486	2,384	1,337	607	1,944	4,195	2,288	2,271
Rhode Island.....	1	548	82	630	348	16	364	779	496	592
South Carolina.....	1	394	46	440	...	30	551*	928	436	415
South Dakota.....	1	192	...	192	134	4	138	369	148	167
Texas.....	2	865	172	1,037	2,322	373	2,695	3,642	913	1,022
Utah.....	1	96	...	96	...	...	...	...	...	...
Vermont.....	2	127	...	127	161	4	165	272	110	104
Virginia.....	3	720	40	760	557	59	1,076*	1,816	720	750
West Virginia.....	3	688	35	723	516	19	535	1,293	621	614
Wisconsin.....	2	282	...	282	168	...	168	410	216	257
Wyoming.....	1	33	...	33	58	...	58	81	26	26
Totals.....	72	18,203	2,863	21,066	18,173	2,716	21,917*	39,956	18,418	14,889

* Partly unclassified.

tories thirteen, tuberculosis clinics nine. Of eighteen sanatoriums equipped for the administration of pneumothorax, thirteen have made arrangements for collapse therapy in the outpatient department.

The reports indicate that only one of the municipal sanatoriums offers facilities for the training of nurses. Listed in the nursing division are eighteen students, 963 registered nurses, 116 unregistered graduates and 451 attendants. Eight institutions in this group are approved by the American Medical Association for residencies in tuberculosis.

CITY-COUNTY SANATORIUMS

In 1935 there were fifteen city-county sanatoriums in operation in eleven states. Sixteen institutions are reported in the present survey, but two of the states are no longer represented on the list, namely Illinois and Ohio. Florida and North Carolina have been added,

including 309 for preventorium care. The following statistical data illustrate the extent of tuberculosis hospitalization in this division: admissions 2,712, patients treated 4,675, average daily census 1,995, census at end of year 1,996, average length of stay 156 days, waiting list 301, number of vacancies 195. Reference should be made to table 33.

Fourteen sanatoriums provide pneumothorax facilities for inpatients and eleven for outpatients, twelve have x-ray departments and eleven report laboratory units. Tuberculosis clinics are now conducted in nine of these institutions.

Ninety-two registered nurses are employed, forty unregistered graduates and 173 attendants.

PRIVATE SANATORIUMS

The greatest reduction in the number of tuberculosis sanatoriums has occurred in the private group, where

there are now 170 institutions as compared to 178 in 1935. At present there are thirty-two states where sanatoriums are operated under private control; formerly also the state of Georgia was included. By comparison with the previous report it will be noted that eighteen sanatoriums have since been added to the list, whereas twenty-seven have been removed.

Additions occurred in the states of Alabama, California, Connecticut, Florida, Louisiana, Massachusetts, Michigan, New Mexico, New York, Ohio, Texas and Virginia. During the same period twenty-seven sanatorium services were discontinued or reclassified in Arizona, California, Colorado, Georgia, Illinois, New Jersey, New Mexico, New York, North Carolina, Pennsylvania, Tennessee, Texas and Washington.

The private sanatoriums represent various types of ownership and control and differ widely in size and completeness of hospital service. Their average capac-

administration of pneumothorax, including 104 that have also made provisions for an outpatient pneumothorax service.

It has been shown that thirteen of these institutions employ student nurses. Altogether the nursing personnel consists of 720 registered nurses, 317 unregistered graduates, 294 students and 593 attendants. It can also be reported that thirteen of the private sanatoriums have qualified for residency approval in tuberculosis.

TUBERCULOSIS DEPARTMENTS

It has been shown in the present report that 630 tuberculosis departments supplement the facilities of the sanatorium division. In addition there is another group of 584 hospitals that admit tuberculous patients or conduct tuberculosis clinics yet do not have an inpatient service that can be classified as a departmental unit. The latter include 533 general hospitals,

Table 31.—County Sanatoriums Classified by States

State	Number of Sanatoriums	Bed Capacity			Patients Admitted			Patients Treated	Average Census	Patients Present
		Adults	Children	Total	Adults	Children	Total			
Alabama.....	5	247	12	259	161	12	173	543	160	177
Arizona.....	12	2,014	501	2,515	2,022	432	2,576	4,938	2,450	2,426
California.....	2	92	...	92	121	2	131	271	65	66
Georgia.....	1	48	...	48	34	...	34	47	20	17
Illinois.....	17	1,498	55	1,553	1,194	42	1,277	2,334	1,158	1,072
Indiana.....	9	1,123	142	1,265	1,209	208	1,768	2,861	1,094	1,075
Iowa.....	4	315	55	370	343	55	398	779	...	359
Kansas.....	1	60	...	60	47	...	47	94	45	38
Kentucky.....	2	89	22	111	117	31	167	261	93	94
Massachusetts.....	7	1,325	16	1,340	1,160	3	1,163	2,372	1,232	1,172
Michigan.....	10	799	40	848	900	46	946	1,620	727	770
Minnesota.....	13	1,427	78	1,505	991	31	1,022	2,436	1,360	1,340
Missouri.....	2	48	...	48	...	...	42	42	...	30
Montana.....	1	115	...	115	166	...	166	280	115	115
New Jersey.....	11	2,347	230	2,577	2,580	248	2,828	5,023	2,315	2,232
New York.....	26	2,886	756	3,142	2,271	625	2,896	5,818	2,845	2,735
North Carolina.....	7	482	41	523	477	22	500	956	451	444
Ohio.....	15	1,661	384	2,245	1,785	317	2,233	4,240	2,054	2,003
Oregon.....	1	41	...	41	82	...	82	123	33	30
Pennsylvania.....	4	332	80	412	396	24	608	851	403	406
South Carolina.....	3	196	10	212	312	33	345	539	203	210
Tennessee.....	1	250	50	300	210	65	275	511	232	234
Texas.....	3	158	24	182	147	35	182	509	164	193
Washington.....	6	533	72	605	488	79	567	1,144	536	531
West Virginia.....	2	68	...	68	53	2	55	118	61	62
Wisconsin.....	17	1,616	124	1,770	1,739	196	2,043	3,623	1,645	1,681
Totals.....	182	19,500	2,706	22,206	19,005	2,569	22,778	42,243	19,481	19,521

ity is the lowest of any of the sanatorium groups, being only seventy-four beds. The state sanatoriums average 293, the county 122, the municipal 424 and the city-county sanatoriums 137. The present capacity is 12,794 beds, as compared to 13,864 in 1935. Included are 11,996 beds for adults and 798 for children with 296 allocated to preventorium care.

Although the number of institutions and the bed capacity have decreased there has been no corresponding reduction in the clinical service. On the contrary there has been a slight increase in patient personnel, as indicated in table 34. The admissions total 14,644, the number of patients treated 23,890 and the average daily census 9,591. In 1935 the corresponding figures were 14,480, 21,104 and 9,490. At the end of the year the private sanatoriums had 750 on the waiting list with vacancies totaling 3,537. A slight reduction occurred in the average length of stay, which is now reported as 147 days.

Of 170 sanatoriums in this group 126 have x-ray departments, 111 have laboratory facilities and sixty-two conduct tuberculosis clinics. One hundred and fifty-one private sanatoriums have facilities for the

eleven mental institutions, three tuberculosis-isolation units, four orthopedic services and thirty-three other hospitals. Classified by control they comprise eighty federal, thirty-three state, twenty-four county, twenty-eight city, five city-county and 414 private hospitals.

Table 35 presents a summary of the tuberculosis service in hospitals that do not fall within the sanatorium classification. This shows that 439 of the 630 tuberculosis departments are in general hospitals, ninety-two in mental institutions, twenty-six in tuberculosis-isolation units, eight in orthopedic hospitals and sixty-five in other divisions.

The general hospitals have 14,824 beds for the treatment of tuberculosis, 13,939 for adults and 885 for children. On comparison with the previous report it is noted that the number of departments has increased by twenty and the bed capacity by 356. The annual admissions showed a decrease, however, from 37,124 to 34,739. Reference should be made to table 9, in which a further classification of admissions is given in accordance with the type of institutional control. The number of patients treated was 46,036, the average daily occupancy 10,119 and the census at the

beginning of the year 11,295. In 1934 the tuberculosis departments of general hospitals had 11,318 patients under treatment on the day of reporting. Of particular interest is the report that 237 of the general hospitals are now in position to administer pneumothorax; twenty-eight other hospitals in the general group indicated also that pneumothorax facilities are available.

The extension of the tuberculosis service into the general hospital field has received the endorsement of the American Medical Association, the American Hospital Association and the National Tuberculosis Association. Services of this type should be under the supervision of physicians competent in this field and should provide proper nursing technic and adequate segregation to prevent the spread of infection to other patients and

ther statistical data concerning the scope of service. It is shown that twenty-one furnish pneumothorax equipment, nineteen have x-ray departments, nineteen provide laboratory facilities and ten conduct tuberculosis clinics. When classified by control, these institutions exhibit the following distribution: county five, city twenty, city-county one. Twenty-six hospitals were likewise included in 1935 but three of the original group are no longer listed, whereas the following institutions have been added: Niagara Falls Municipal Hospital, Niagara Falls, N. Y.; Schenectady City Hospital, Schenectady, N. Y., and the Philadelphia Hospital for Contagious Diseases, Philadelphia.

It would seem that the information concerning tuberculosis departments in nervous and mental hospitals is

Table 32.—City Sanatoriums Classified by States

State	Number of Sanatoriums	Bed Capacity			Patients Admitted			Patients Treated	Average Census	Patients Present
		Adults	Children	Total	Adults	Children	Total			
District of Columbia.....	1	400	300	700	652	...	652	1,046	515	580
Illinois.....	4	1,583	96	1,679	1,428	527	1,955	3,525	1,588	1,575
Massachusetts.....	2	696	...	696	625	...	625	1,233	597	631
Michigan.....	2	828	160	988	656	160	816	1,689	921	873
Missouri.....	2	767	40	807	758	16	774	1,456	710	721
New York.....	5	2,116	380	2,496	2,676	336	3,012	5,512	2,621	2,667
Ohio.....	1	370	64	434	380	58	438	863	432	434
Pennsylvania.....	1	255	45	300	361	50	411	685	280	287
Virginia.....	2	322	64	386	280	30	310	594	296	290
Totals.....	20	7,337	1,149	8,486	7,816	1,177	8,993	16,603	7,960	8,008

Table 33.—City-County Sanatoriums Classified by States

State	Number of Sanatoriums	Bed Capacity			Patients Admitted			Patients Treated	Average Census	Patients Present
		Adults	Children	Total	Adults	Children	Total			
California.....	1	111	...	111	145	...	145	235	85	101
Florida.....	2	84	22	106	198	27	225*	311	100	101
Georgia.....	2	204	79	283	178	28	206	469	261	257
Kansas.....	1	50	20	70	90	121	211	268	55	50
Kentucky.....	1	422	98	520	377	127	504	996	490	492
New York.....	1	79	50	129	73	46	119	245	125	125
North Carolina.....	1	23	...	23	52	1	53	70	22	26
Pennsylvania.....	1	55	2	57	101	...	101	154	52	53
South Carolina.....	1	26	...	26	47	...	47	63	22	19
Tennessee.....	2	395	115	510	350	87	437	886	461	453
Texas.....	3	306	50	356	504	157	661	978	312	310
Totals.....	16	1,755	436	2,191	2,115	594	2,712*	4,675	1,995	1,996

* Partly unclassified.

hospital personnel. The fact that tuberculous patients are now accepted in at least 971 general hospitals would seem to emphasize the need for adequate isolation facilities. These could be utilized not only in the treatment of tuberculosis but also for the removal of other infectious diseases from the open wards.

The tuberculosis-isolation hospitals offer a combined service in tuberculosis and contagious diseases. Their total capacity is 7,144 beds, of which 2,813 are assigned to the tuberculosis division. As compared with the previous report, this indicates an increase of 257 beds. The number of admissions decreased, however, from 4,456 to 4,112 but the average daily occupancy increased from 2,134 to 2,448. At the end of the twelve months period there were 2,365 patients under treatment.

The list accompanying this report contains the names of twenty-six tuberculosis-isolation hospitals and fur-

incomplete even though reports were received from practically all of the institutions in this field. Apparently some of the hospitals failed to indicate their facilities for tuberculosis, since only ninety-two departments were reported as compared to 193 in the previous survey. Although the centralization of tuberculosis service has already been noted in some of the state hospitals, it would not appear that this factor alone could be responsible for a reduction of over 50 per cent in the number of institutions treating tuberculous insane. Census reports show a similar decrease especially at the end of the twelve months period, when the number of patients under treatment was 4,743 as compared to 9,321 in 1934.

The tuberculosis departments in mental hospitals report 7,189 beds at present, 1,874 patients admitted during the year and an average daily occupancy of 3,858. The previous survey listed 9,478 beds and

2,425 admissions. In mental institutions the segregation of tuberculous patients is especially important to prevent the spread of infection in crowded wards. Separate departments are therefore considered necessary to facilitate the institutional control of tuberculosis and the application of scientific therapy. In this connection it is of interest to note that thirty-six psychiatric hospitals have supplied facilities for the administration of pneumothorax.

For comparative data concerning orthopedic hospitals and other departments, reference should be made to table 35 in the present report and to table 32 of the previous survey.

One hundred and twenty-six tuberculosis departments under state control report 7,633 beds, 4,781 admissions, 9,748 patients treated and a census of

representing 99 per cent of the total bed capacity of all registered hospitals.

2. The statistical data included in this report cover a twelve months period ended either Sept. 30 or Dec. 31, 1938.

3. Included in the present study are 479 sanatoriums, 630 tuberculosis departments and thirty-one preventoriums, a total of 1,140 institutions.

4. The sanatorium group contains nineteen federal, seventy-two state, 182 county, twenty municipal, sixteen city-county and 170 private sanatoriums.

5. The tuberculosis departments are located in 439 general hospitals, ninety-two mental institutions, twenty-six tuberculosis-isolation hospitals, eight orthopedic units and sixty-five hospital departments of

Table 34.—Private Sanatoriums Classified by States

State	Number of Sanatoriums	Bed Capacity			Patients Admitted			Patients Treated	Average Census	Patients Present
		Adults	Children	Total	Adults	Children	Total			
Alabama.....	2	105	...	105	178	5	183	241	90	79
Arizona.....	10	332	25	357	263	50	363*	560	168	149
California.....	24	1,525	34	1,559	1,142	46	1,772*	2,635	1,065	882
Colorado.....	15	1,400	76	1,476	719	63	866	1,778	948	925
Connecticut.....	3	257	...	257	462	4	466	699	226	226
Florida.....	2	31	...	31	...	...	25*	25	15	...
Illinois.....	6	517	32	549	672	42	714	1,090	418	426
Louisiana.....	4	258	16	274	324	18	342	477	147	153
Maine.....	1	30	...	30	23	1	24	47	19	17
Maryland.....	3	226	48	274	229	65	294	558	257	277
Massachusetts.....	9	333	41	374	203	24	235*	460	223	266
Michigan.....	10	804	51	855	1,078	21	1,099	1,841	757	744
Minnesota.....	2	53	...	53	31	3	44*	69	22	18
Mississippi.....	1	45	...	45	29	...	29	58	25	17
Missouri.....	2	189	32	221	222	35	257	411	165	154
New Hampshire.....	1	81	25	106	83	20	103	192	83	89
New Jersey.....	5	236	...	236	173	...	173	304	165	126
New Mexico.....	3	181	5	186	259	1	260	384	130	133
New York.....	20	2,402	129	2,531	2,916	132	3,057*	5,294	2,270	2,223
North Carolina.....	9	333	...	333	386	2	444*	629	181	183
Ohio.....	5	405	8	413	377	12	492*	848	344	374
Oklahoma.....	1	25	...	25	111	...	111	124	14	10
Oregon.....	1	40	...	40	123	3	126	165	28	30
Pennsylvania.....	7	914	89	994	1,478	41	1,519	2,325	829	836
Rhode Island.....	1	75	...	75	16	...	16	52	35	33
South Carolina.....	1	70	...	70	75	...	75	121	44	35
Tennessee.....	3	275	100	375	200	53	267*	621	257	264
Texas.....	10	502	...	502	614	3	637*	931	277	238
Virginia.....	3	110	20	130	224	50	274	409	97	141
Washington.....	12	130	5	135	222	6	228	360	125	129
West Virginia.....	12	30	41	71	...	44	44	73	61	41
Wisconsin.....	12	82	30	112	96	10	106	207	106	99
Totals.....	170	11,906	798	12,794	12,927	744	14,644*	23,690	9,591	9,237

* Partly unclassified.

5,012 at the end of the year. The county departments, sixty-two in all, have 4,144 beds. They admitted 5,637 patients and treated 8,586. Their census at the end of the twelve months period was 3,017. In sixty-two municipal departments there were 5,273 beds reported, 13,839 admissions, 18,401 patients treated and 4,990 patients under treatment at the time of reporting. The bed capacity in seven departments under city-county management is 1,160. These units had 1,915 admissions in 1938, a total of 2,886 patients treated and 1,011 under treatment at the end of the year. In 244 private departments the bed capacity was 2,708, the annual admission rate 6,880 and the number of patients treated 8,999. The census on the last day of the twelve months period was 1,916.

SUMMARY

1. The present report of tuberculosis facilities in the United States supplements the survey of 1933-1935. It is based on information received from 5,950 hospitals

prisons, reformatories, convalescent units and other institutions.

6. There are at present 98,801 beds for tuberculosis, 87,084 for adults and 11,717 for children. The sanatoriums have 70,713 beds, the tuberculosis departments 25,944 and the preventoriums 2,144. In 1935 a total of 95,198 beds were reported, including 11,647 for children.

7. Included in the beds for children are 4,830 for preventorium care. The sanatoriums furnish 2,447 beds for this purpose, the tuberculosis departments 239 and the regular preventoriums 2,144.

8. The sanatoriums, tuberculosis departments and preventoriums admitted 122,342 patients during a twelve months period, discharged 120,366, treated 202,021 and maintained an average occupancy of 79,300. The census at the beginning of the year was 79,679, on the last day 80,403. In 1934 there were 121,706 patients admitted and 81,652 patients present on the day of reporting.

9. The number of children admitted was 13,400, including 8,332 in the sanatoriums, 1,764 in the tuberculosis departments and 3,304 in the preventoriums. The previous survey reported 15,523.

10. The average length of stay in the tuberculosis sanatoriums was 164 days as compared to 166 in 1934. In the tuberculosis departments the average was identical with the previous report of 101 days.

11. The report indicates that 93 per cent of the patients had some form of tuberculous infection. Of

in 361 of the sanatoriums and 222 of the tuberculosis departments. This represents an appreciable increase in the facilities for collapse therapy.

14. Roentgenologic service is available in 410 sanatoriums and 568 tuberculosis departments. In the previous survey, 368 sanatoriums reported x-ray facilities.

15. The present report indicates that 364 sanatoriums and 558 tuberculosis departments have laboratory departments. Apparently no marked change has occurred in this phase of the sanatorium service.

Table 35.—Tuberculosis Departments of Hospitals Classified by States and According to Type of Service

State	General			Tuberculosis-Isolation			Nervous and Mental			Orthopedic			Other		
	Number of Sanatoriums	TB Beds	TB Patients Admitted	Number of Institutions	TB Beds	TB Patients Admitted	Number of Institutions	TB Beds	TB Patients Admitted	Number of Institutions	TB Beds	TB Patients Admitted	Number of Institutions	TB Beds	TB Patients Admitted
Alabama.....	6	58	146	42	..	..	..	..	..	..	..	..	1	50	18
Arizona.....	17	630	1,267	385	..	..	..	..	..	..	..	..	..	..	..
Arkansas.....	2	28	54	28	..	..	..	..	..	..	..	..	..	..	..
California.....	39	2,487	3,786	1,803	..	..	..	..	..	..	..	..	..	..	..
Colorado.....	11	882	1,909	282	..	..	..	..	..	..	..	..	..	..	..
Connecticut.....	2	27	105	26	2	58	106	28	..	..	..	..	..	..	..
Delaware.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
District of Columbia.....	9	338	1,225	314	..	..	..	..	..	..	..	..	..	..	..
Florida.....	12	198	325	110	..	..	..	..	..	..	..	..	..	..	..
Georgia.....	4	48	222	9	..	..	..	..	..	..	..	..	..	..	..
Idaho.....	3	45	50	34	..	..	..	..	..	..	..	..	..	..	..
Illinois.....	15	679	1,650	785	..	..	..	..	..	..	..	..	..	..	..
Indiana.....	6	108	205	83	..	..	..	..	..	..	..	..	..	..	..
Iowa.....	8	10	98	8	..	..	..	..	..	..	..	..	..	..	..
Kansas.....	9	110	244	96	..	..	..	..	..	..	..	..	..	..	..
Kentucky.....	7	24	284	18	..	..	..	..	..	..	..	..	..	..	..
Louisiana.....	7	500	1,981	445	..	..	..	..	..	..	..	..	..	..	..
Maine.....	4	37	121	39	..	..	..	..	..	..	..	..	..	..	..
Maryland.....	5	326	93	280	..	..	..	..	..	..	..	..	..	..	..
Massachusetts.....	10	701	387	285	7	338	411	222	5	220	54	220	3	11	69
Michigan.....	13	456	1,143	361	3	1,005	1,637	902	7	497	70	236	..	..	..
Minnesota.....	12	543	968	459	..	..	..	..	..	..	..	..	..	..	..
Mississippi.....	17	8	114	..	..	..	..	..	..	..	..	..	..	..	..
Missouri.....	12	200	461	140	1	60	154	54	2	108	70	35	1	10	62
Montana.....	8	43	181	33	..	..	..	..	..	..	..	..	..	..	..
Nebraska.....	6	126	163	96	..	..	..	..	..	..	..	..	..	..	..
Nevada.....	4	14	38	6	..	..	..	..	..	..	..	..	..	..	..
New Hampshire.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Jersey.....	11	197	917	154	4	525	514	406	5	701	338	571	..	..	..
New Mexico.....	9	402	716	275	..	..	..	..	..	..	..	..	..	..	..
New York.....	39	2,502	8,032	2,450	5	484	1,029	475	14	1,956	511	1,612	..	..	..
North Carolina.....	5	12	147	..	..	..	..	..	..	..	..	..	..	..	..
North Dakota.....	7	19	58	2	..	..	..	..	..	..	..	..	..	..	..
Ohio.....	18	594	1,646	569	..	..	..	..	..	..	..	..	..	..	..
Oklahoma.....	9	216	681	172	..	..	..	..	..	..	..	..	..	..	..
Oregon.....	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..
Pennsylvania.....	15	763	2,059	564	1	25	7	6	11	807	252	488	1	30	24
Rhode Island.....	..	..	..	..	1	60	131	..	1	83	22	60	..	..	..
South Carolina.....	3	86	93	45	..	..	..	..	..	..	..	..	..	..	..
South Dakota.....	5	38	94	83	..	..	..	..	..	..	..	..	..	..	..
Tennessee.....	9	51	264	34	..	..	..	..	2	157	..	83	..	..	..
Texas.....	15	477	850	310	..	..	..	..	2	189	..	..	..	..	..
Utah.....	4	48	62	40	..	..	..	..	..	..	..	..	..	..	..
Vermont.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Virginia.....	7	72	143	35	..	..	..	..	3	228	61	170	..	..	..
Washington.....	12	432	590	352	1	250	120	212	3	180	7	6	..	..	..
Wisconsin.....	4	17	168	7	..	..	..	..	..	..	..	..	..	..	..
Wyoming.....	3	5	21	4	..	..	..	..	1	15	7	10	..	..	..
Totals.....	439	14,824	34,739	11,470	26	2,813	4,112	2,265	92	7,189	1,874	4,743	8	283	475

this group 6.7 per cent were classified as first infection type, 5.1 per cent as nonpulmonary forms and 88.2 per cent as frank pulmonary tuberculosis. Pulmonary cases of the reinfection type showed the following condition on admission: minimal 12.9 per cent, moderately advanced 32.1 per cent and far advanced 55 per cent. In 1934 the corresponding ratios were 13.1, 29.7 and 57.2 per cent.

12. The waiting list totals 8,797, the number of vacancies 16,254. In the state and city-county sanatoriums and the municipal tuberculosis departments the waiting list exceeds the number of vacancies.

13. Equipment for pneumothorax is provided by 442 sanatoriums and 328 tuberculosis departments. Facilities for outpatient pneumothorax are also included

16. Outpatient clinics are now conducted in 264 sanatoriums and 259 tuberculosis departments. Nineteen of the sanatoriums and thirteen of the departments report field clinics.

17. It is hoped that the present report will prove useful to the medical profession and other agencies interested in the prevention, treatment and control of tuberculosis. For comparative data, reference should be made to the survey of 1935.

The preparation of this report would not have been possible without the assistance of the hospital and sanatorium superintendents, whose helpful cooperation in supplying accurate and complete information is highly appreciated. Acknowledgment is also made of the cooperation extended by the National Tuberculosis Association.

TUBERCULOSIS SANATORIUMS, DEPARTMENTS AND PREVENTORIUMS
(Sanatoriums 479, Departments 630, Preventoriums 31)

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TUBERCULOSIS SANATORIUMS

County	TUBERCULOSIS SANATORIUMS																		
	Bed Capacity			Admissions						Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants	
	Adults	Children	Total	Adults	Children	Total	Daily Average	Patients Treated	Patients Discharged										
ALABAMA																			
Etowah County Tuberculosis Sanatorium, Alabama City	18	..	18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Jefferson Sanatorium, Birmingham	100	..	100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Morgan County Tuberculosis Sanatorium, Flint	40	..	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Batson Memorial Sanatorium, Lafayette	47	..	47	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mobile County Tuberculosis Sanatorium, Mobile	42	..	42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Private	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Susie Parker Stringfellow Memorial Hospital, Anniston	15	..	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Montgomery Tuberculosis Sanatorium, Montgomery	90	..	90	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	352	12	364	125	5	130	76	173	79	30	64	2	7	6	31	12	..	..	..
ARIZONA																			
Federal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kayenta Sanatorium, Kayenta	45	9	54	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phoenix Indian Sanatorium, Phoenix	60	70	130	70	..	70	..	..	..	..	..	..	..	..	..	..	..	..	..
San Xavier Indian Sanatorium, Tucson	30	16	46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Winslow Indian Sanatorium, Winslow	45	6	51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
State	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
State Welfare Sanitarium, Tempe	110	..	110	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Private	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Luke's Home, Phoenix	65	..	65	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pamsegauf Sanatorium, Prescott	30	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Anson Rest Home, Tucson	25	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arizona State Elk's Association Hospital, Tucson	25	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Barfield Sanitarium, Tucson	22	..	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Comstock Children's Hospital, Tucson	34	..	34	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hillcrest Sanatorium, Tucson	16	..	16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Reardon Sanatorium, Tucson	33	..	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Luke's in-the-Desert Sanitarium, Tucson	82	..	82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southern Pacific Sanatorium, Tucson	622	126	748	70	748	101	980	460	1,357	684	58	425	41	8	10	13	4	56	63
Totals	32	..	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ARKANSAS																			
Federal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
McRae Memorial Sanatorium, Alexander	32	..	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arkansas Tuberculosis Sanatorium, State Sanatorium	635	95	730	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	667	95	762	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
CALIFORNIA																			
Federal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Veterans Admin. Facility, Livermore	312	..	312	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
County	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Alhambra	637	95	732	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wish-Lah Sanatorium, Aubrey	26	..	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Humboldt County School for the Tuberculous, Eureka	26	..	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stony Brook Retreat, Keene	65	..	65	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arroyo-Del Valle Sanatorium, Livermore	103	..	103	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bret Harte Sanatorium, Morphys	94	..	94	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pauline Rest Home, San Fernando	83	..	83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Santa Clara County Sanatorium, San Jose	154	..	154	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
San Luis Obispo County Tuberculosis Sanatorium, San Luis Obispo	1,017	..	1,017	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tulare-Kings Counties Joint Tuberculosis Hospital, Springville	45	..	45	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Weimar Joint Sanatorium, Weimar	20	..	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
City-County	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hassler Health Home, Redwood City	104	..	104	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Private	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Our Lady of Lourdes Sanatorium, Alta Loma	111	..	111	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southern Sierras Sanatorium, Banning	25	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
California Sanatorium, Belmont	33	..	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Collax School for the Tuberculous, Colfax	90	..	90	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Los Angeles Sanatorium, Duarte	50	..	50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mulrose Sanatorium, Duarte	170	..	170	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Santa Teresa Sanatorium, Duarte	21	..	21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hillcrest Sanatorium, La Crescenta	100	..	100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Antelope Valley Sanatorium and Hospital, Lancaster	45	..	45	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Private	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
La Vina Sanatorium, La Vina	118	..	118	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Barlow Sanatorium, Los Angeles	50	..	50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Belvedere Sanatorium, Los Angeles	100	..	100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Poughkeepsie Sanatorium, Los Angeles	40	..	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ex-Patients Home of the Jewish Consumptive Relief Association, Los Angeles	14	..	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Oak's Sanatorium, Los Gatos	70	..	70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	60	..	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

1. Included in beds for children.

2. Does not include deaths.

3. Closed December 1, 1920.

* Approved for Residences in Tuberculosis.

1. Included in beds for children. 2. Does not include deaths. 3. Closed December 1, 1932.

* Approved for Residences in Tuberculosis.

TUBERCULOSIS SANATORIUMS—Continued

	Bed Capacity				Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants ³
	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total												
CALIFORNIA—Continued																			
Arequipa Sanatorium, Manor	46	..	46	..	67	..	67	42	110	80	1	32	..	Yes	Yes	Yes	..	5	1
Maryknoll Sanatorium, Monrovia	40	..	40	..	35	..	35	80	58	17	4	30	3	Yes	Yes	Yes	..	1	..
Dore Sanatorium, Monrovia	58	..	58	..	..	..	98	..	98	..	..	..	..	Yes	Yes	Yes	..	..	..
Norumbega Sanatorium, Monrovia	20	..	20	..	..	..	87	11	87	..	6	..	..	Yes	Yes	Yes	..	..	..
Pottenger Sanatorium and Clinic, Monrovia ⁺	120	..	120	..	83	4	87	62	161	76	16	61	..	Yes	Yes	Yes	Yes	10	..
Independent Order of Foresters California Tuberculosis Sanatorium, Pacoima	100	..	100	..	15	..	15	20	35	6	2	20	..	No	No	Yes	..	5	1
Canyon Sanatorium, Redwood City	50	..	50	..	60	2	62	27	85	48	4	27	..	Yes	Yes	Yes	..	5	1
Alum Rock Sanatorium, San Jose	40	..	40	..	134	1	135	40	164	114	8	43	5	Yes	Yes	Yes	Yes	3	4
Sunland Sanatorium, Sunland	60	..	60	..	74	..	74	56	129	47	9	58	..	No	Yes	Yes	..	1	2
Totals	4,192	535	4,727	206	3,959	478	5,143	4,123	8,987	3,513	593	3,904	285	28	32	34	17	491	59
COLORADO																			
Private																			
Mesa Vista Sanatorium, Boulder	40	5	45	..	25	6	31	28	31	20	9	32	..	No	No	Yes	..	1	5
Cragmor Sanatorium, Colorado Springs	130	..	130	..	..	..	56	27	56	..	..	..	..	Yes	Yes	Yes	..	..	..
Sunnyrest Sanatorium, Colorado Springs	50	..	50	..	..	..	15	..	15	..	..	..	..	Yes	Yes	Yes	..	..	..
Bethesda Sanatorium, Denver	55	13	68	13	38	13	51	26	74	30	7	37	..	Yes	Yes	Yes	Yes	3	4
Costello Home, Denver	16	..	16	..	4	..	4	10	16	5	..	7	..	No	No	Yes	Yes	1	..
Ex-Patients' Tubercular Home, Denver	76	..	76	..	15	..	15	60	66	17	2	42	5	Yes	Yes	Yes	Yes	2	1
National Jewish Hospital, Denver ⁺	188	58	246	36	121	41	162	242	409	147	21	241	32	Yes	Yes	Yes	Yes	3	56
Oakes Home Sanitarium, Denver	75	..	75	..	66	..	66	26	90	26	8	27	..	No	No	Yes	..	10	3
St. Francis Sanatorium, Denver	16	..	16	..	21	..	21	14	35	16	4	15	5	No	No	Yes	..	3	1
Sands House, Denver	48	..	48	..	19	..	19	36	50	24	9	30	..	Yes	Yes	Yes	..	..	2
Craig Colony, Edgewater	51	..	51	..	21	..	21	44	64	18	10	40	..	Yes	Yes	Yes	..	3	..
Swedish National Sanatorium, Englewood	90	..	90	..	82	..	82	51	141	63	23	51	..	Yes	Yes	Yes	..	3	..
Sanatorium of the Jewish Consumptive's Relief Society, Spivak ⁺	300	..	300	..	134	..	134	215	351	126	19	224	108	Yes	Yes	Yes	Yes	29	..
Evangelical Lutheran Sanitarium, Wheat Ridge ..	110	..	110	..	60	1	61	88	146	44	16	85	5	Yes	Yes	Yes	..	11	..
Modern Woodmen of America Sanatorium, Woodmen	155	..	155	..	126	2	128	91	234	141	12	94	18	Yes	Yes	Yes	Yes	8	3
Totals	1,400	76	1,476	49	719	63	866	948	1,778	677	140	925	173	10	10	15	6	77	55
CONNECTICUT																			
State																			
Cedarcrest Sanatorium, Hartford	223	..	223	..	190	..	190	247	449	175	58	222	..	Yes	Yes	Yes	..	31	10
Underhill, Meriden State Tuberculosis Sanatorium, Meriden .....	..	232	232	..	63	77	140	191	330	143	15	189	17	Yes	Yes	Yes	Yes	27	2
Norwich State Tuberculosis Sanatorium, Norwich ⁺ ..	404	..	404	..	272	..	272	392	659	207	58	394	65	No	Yes	Yes	Yes	73	9
Laurel Heights State Tuberculosis Sanatorium, Shelton	350	..	350	..	248	..	248	344	586	183	63	343	130	Yes	Yes	Yes	Yes	75	7
The Seaside, Waterford .....	..	175	175	..	7	15	22	140	167	16	3	135	..	Yes	Yes	No	Yes	9	..
Private																			
Wildwood Sanatorium, Hartford	50	..	50	..	74	..	74	30	113	81	3	30	..	Yes	Yes	Yes	..	231	50
Gaylord Farm Sanatorium, Wallingford ⁺	145	..	145	..	208	4	212	140	345	203	7	135	..	Yes	Yes	Yes	Yes	18	..
William Wirt Winchester Hospital, West Haven ..	62	..	62	..	180	..	180	56	241	162	18	61	..	Yes	Yes	Yes	Yes	18	..
Totals	1,234	427	1,661	..	1,242	96	1,338	1,540	2,890	1,170	225	1,509	221	7	8	7	6	575	69
DELAWARE																			
State																			
Brandywine Sanatorium, Marshallton	124	36	160	..	75	11	86	140	221	58	23	137	16	Yes	Yes	Yes	Yes	10	21
Edgewood Sanatorium, Marshallton	30	10	40	10	26	2	28	33	61	19	16	34	25	No	No	Yes	..	6	..
Totals	154	46	200	10	101	13	114	173	285	77	39	171	41	1	1	2	1	16	21
DISTRICT OF COLUMBIA																			
City																			
Tuberculosis Sanatorium (Glendale, Md., P.O.) ⁺ ..	400	300	700	..	632	..	632	515	1,046	464	116	580	..	Yes	Yes	Yes	..	53	..
FLORIDA																			
State																			
Florida State Sanatorium, Orlando	318	..	318	..	467	1	468	313	784	103	51	316	..	Yes	Yes	Yes	..	50	3
County																			
St. Johns County Welfare Home for Tuberculosis Patients, St. Augustine	12	..	12	..	..	..	6	..	8	..	..	..	..	..	..	..	..	6	8
Hillsboro County Tuberculosis Sanatorium, Tampa ..	80	..	80	..	121	2	123	65	263	79	..	66	..	No	No	Yes	..	..	..
City-County																			
Negro Tuberculosis Hospital, Jacksonville	50	..	50	..	140	..	140	48	187	11	74	50	10	No	No	No	..	3	4
Escambia County Tuberculosis Sanatorium, Pensacola	34	22	56	22	58	27	85	52	124	26	10	51	9	Yes	Yes	Yes	Yes	5	19
Private																			
Hazelhurst Sanatorium, Jacksonville	21	..	21	..	..	..	25	15	25	..	..	..	..	No	No	..	..	..	..
Palm Beach County Tuberculosis Sanatorium for Negroes, West Palm Beach	10	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	525	22	547	22	789	30	852	493	1,391	219	135	483	19	2	2	3	1	61	23
GEORGIA																			
State																			
State Tuberculosis Sanatorium, Alto	232	66	328	72	515	70	585	260	879	556	16	259	575	Yes	Yes	Yes	Yes	13	5
County																			
Muscogee County Tuberculosis Sanatorium, Columbus	48	..	48	..	34	..	34	20	47	45	..	17	..	Yes	Yes	Yes	Yes	1	2
City-County																			
Battle Hill Sanatorium, Atlanta	177	79	256	79	193	26	169	225	468	160	46	231	259	Yes	Yes	Yes	..	7	2
Hopewell Sanatorium, Macon	27	..	27	..	35	2	37	26	61	29	6	26	..	Yes	Yes	Yes	..	..	1
Totals	484	175	659	151	727	96	825	541	1,295	769	63	523	825	4	4	4	3	23	6
IDAHO																			
Federal																			
Fort Lapwai Sanatorium, Lapwai .....	..	152	152	66	..	293	293	125	250	129	5	127	22	Yes	Yes	Yes	..	8	6

1. Included in beds for children. 2. Does not include deaths. + Approved for Residence in Tuberculosis.

TUBERCULOSIS SANATORIUMS—Continued

	Bed Capacity			Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants	
	Adults	Children	Total	Adults	Children	Total													
ILLINOIS																			
County ⁴																			
Kane County Springbrook Sanitarium, Aurora.....	73	6	79	64	6	70	76	150	66	15	75	10	Yes	Yes	Yes	Yes	5	5	
Elmgrove Sanatorium, Bushnell	40	..	40	40	1	41	31	69	25	7	23	2	Yes	Yes	Yes	Yes	4	2	
Macon County Tuberculosis Sanatorium, Decatur ⁺	80	..	80	68	..	68	63	139	72	3	67	..	Yes	Yes	Yes	Yes	6	..	
DeKalb County Tuberculosis Sanatorium, DeKalb	32	..	32	37	..	37	25	47	8	3	23	..	Yes	Yes	Yes	Yes	3	..	
Madison County Tuberculosis Sanitarium, Edwardsville	85	8	93	108	5	113	78	187	85	11	73	..	Yes	Yes	Yes	Yes	5	14	
Morgan County Tuberculosis Sanatorium "Oak-lawn," Jacksonville	40	..	40	40	..	40	41	56	23	7	22	..	Yes	Yes	Yes	Yes	3	2	
Will County Tuberculosis Sanatorium, Joliet.....	96	..	96	67	..	67	82	152	36	32	84	..	Yes	Yes	Yes	Yes	4	7	
Oak Knoll Sanatorium, Mackinaw.....	45	..	45	41	..	41	37	76	25	4	34	..	No	Yes	Yes	Yes	1	5	
Woodford County Tuberculosis Sanatorium, Minonk	10	..	10	10	..	10	5	15	11	3	6	..	Yes	No	..	..	2	..
Fairview Sanatorium, Normal	50	..	50	35	..	35	41	76	27	7	44	8	No	Yes	Yes	Yes	5	4	
Cook County Tuberculosis Hospital, Oak Forest..	593	41	634	489	23	512	458	942	350	134	447	..	Yes	Yes	Yes	Yes	8	97	
Highland, Ottawa ³	54	..	54	..	..	41	41	41	..	..	..	..	Yes	Yes	Yes	Yes	2	6
Livingston County Sanatorium, Pontiac.....	34	..	34	43	6	49	29	79	41	4	34	..	No	Yes	Yes	Yes	4	..	
Hillcrest, Quincy	50	..	50	33	..	33	45	83	31	5	36	..	Yes	Yes	Yes	..	5	4	
Rock Island County Tuberculosis Sanatorium, Rock Island	76	..	76	82	..	82	65	148	70	17	60	..	Yes	Yes	Yes	Yes	8	..	
The Outlook, Urbana	48	..	48	37	1	38	35	74	30	6	39	3	No	Yes	Yes	Yes	7	..	
Lake County Sanatorium, Waukegan.....	92	..	92	.. Opened September 23, 1939					..	..	..	..	Yes	Yes	Yes	..	..	..
City																			
City of Chicago Municipal Tuberculosis Sanitarium, Chicago	1,105	96	1,201	883	520	1,403	1,178	2,574	1,374	237	1,174	..	Yes	Yes	Yes	Yes	112	34	
Municipal Tuberculosis Home, North Riverside....	265	..	265	231	..	231	220	447	234	6	215	..	..	Yes	Yes	Yes	8	3
Peoria Municipal Tuberculosis Sanitarium, Peoria ⁺	93	..	93	160	7	167	88	256	145	15	88	..	Yes	Yes	Yes	Yes	13	..	
Rockford Municipal Tuberculosis Sanatorium, Rockford ⁺	120	..	120	154	..	154	102	248	83	20	98	..	Yes	Yes	Yes	Yes	11	2	
Private																			
Fox River Sanitarium, Batavia.....	85	..	85	100	..	100	53	148	60	10	61	6	Yes	Yes	Yes	Yes	2	4	
Edward Sanatorium, Naperville	97	..	97	201	..	201	73	277	199	16	78	..	Yes	Yes	Yes	Yes	19	2	
Ottawa Tuberculosis Sanatorium, Ottawa.....	133	..	133	181	6	187	119	232	122	33	126	5	Yes	Yes	Yes	Yes	3	..	
Palmer Sanatorium, Springfield.....	74	..	74	55	1	56	63	109	47	9	61	..	Yes	Yes	Yes	Yes	4	10	
Winfield Sanatorium, Winfield	78	32	110	100	35	135	80	202	137	13	65	..	Yes	Yes	Yes	Yes	..	6	
Zane Sanatorium, Winfield	50	..	50	35	..	35	30	72	30	7	25	..	Yes	Yes	Yes	..	6	..	
Totals.....	3,598	183	3,781	73	3,294	611	3,946	3,164	6,949	3,339	644	3,073	34	22	26	26	21	250	210
INDIANA																			
State																			
Indiana State Sanatorium, Rockville.....	250	..	250	129	47	223	214	425	275	15	150	300	Yes	Yes	Yes	Yes	8	17	
County																			
Ella B. Kehler Hospital, Anderson.....	50	25	75	50	10	60	33	95	29	2	33	..	No	Yes	Yes	..	3	..	
Lake County Tuberculosis Sanatorium, Crown Point	190	10	200	353	38	391	197	596	156	42	200	88	Yes	Yes	Yes	Yes	12	20	
Boehme	115	15	130	257	99	356	128	500	222	23	119	..	Yes	Yes	Yes	Yes	4	25	
Irene B.	207	30	237	..	..	291	201	480	272	63	208	..	Yes	Yes	Yes	Yes	32	4
Sunnyside Sanatorium, Indianapolis ⁺	238	12	250	49	2	51	37	86	40	12	35	..	Yes	Yes	Yes	Yes	8	3	
William Ross Sanatorium, Lafayette.....	41	..	41	212	25	237	245	495	211	55	229	22	Yes	Yes	Yes	..	11	22	
Smith-Esteb Memorial Hospital, Richmond.....	51	..	51	44	1	45	28	72	37	5	30	..	Yes	Yes	Yes	..	3	4	
Healthwin Hospital, South Bend.....	165	50	215	180	93	273	198	454	226	37	191	..	Yes	Yes	Yes	Yes	10	20	
Hillcrest Tuberculosis Hospital, Vincennes.....	66	..	66	64	..	64	27	83	15	10	30	..	Yes	Yes	Yes	Yes	4	2	
Totals.....	1,373	142	1,515	25	1,338	315	1,991	1,308	3,256	1,483	269	1,225	410	9	10	10	7	95	116
IOWA																			
Federal																			
Sac and Fox Sanatorium, Toledo.....	70	..	70	24	10	34	64	103	49	2	54	..	Yes	Yes	Yes	..	6	4	
State																			
State Sanatorium, Oakdale	420	..	420	291	..	291	389	642	189	44	409	53	Yes	Yes	Yes	Yes	10	46	
County																			
Pine Knoll Sanitarium, Davenport.....	80	20	100	93	29	122	77	197	112	14	77	..	Yes	Yes	Yes	..	7	4	
Broadlawn Polk County Public Hospital, Des Moines	100	..	100	90	2	92	56	144	63	25	57	..	Yes	Yes	Yes	Yes	6	4	
Sunny Cr	70	..	70	88	..	88	66	162	17	17	63	..	Yes	Yes	Yes	Yes	4	..	
Sunnyside	65	35	100	72	24	96	106	202	90	22	87	3	Yes	Yes	Yes	Yes	6	15	
Totals.....	805	55	860	658	65	723	758	1,524	519	124	822	56	6	6	6	4	39	73	
KANSAS																			
State																			
Kennedy Memorial Hospital, Norton.....	253	..	253	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
State Sanatorium for Tuberculosis, Norton.....	266	24	290	193	30	223	323	553	183	53	325	..	Yes	Yes	Yes	Yes	..	..
County																			
Sedgwick County Tuberculosis Sanitarium, Wichita	60	..	60	47	..	47	45	94	41	15	38	..	No	No	Yes	..	7	..	
City-County																			
Hillcrest Sanatorium, Topeka	50	20	70	90	121	211	55	263	212	28	50	..	Yes	Yes	Yes	..	9	5	
Totals.....	620	44	673	335	151	486	423	920	436	96	413	..	2	2	3	1	16	5	
KENTUCKY																			
Federal																			
Veterans Administration Facility, Outwood.....	322	..	322	639	..	639	248	919	568	85	229	..	Yes	Yes	Yes	..	37	49	
State																			
State Tuberculosis Sanatorium, Louisville.....	125	5	130	227	1	228	91	259	188	11	107	..	Yes	Yes	Yes	Yes	13	13	
County																			
Covington-Kenton County Tuberculosis Hospital, Covington	17	..	17	..	..	19	..	19	..	..	..	..	No	No	Yes	..	..	..
Julius Mark Sanatorium, Lexington.....	72	22	94	117	31	148	93	242	135	13	94	4	Yes	Yes	Yes	..	3	11	
City-County																			
Waverly Hills Sanatorium, Waverly Hills.....	422	93	520	377	127	504	490	996	379	112	499	..	Yes	Yes	Yes	Yes	16	82	
Totals.....	958	125	1,083	1,290	139	1,438	922	2,465	1,270	221	829	4	4	4	5	2	69	155	

1. Included in beds for children. 2. Does not include deaths. 3. Eighty-five bed addition under construction. 4. St. Clair County Sanatorium, East St. Louis, 105 beds. Now under construction. + Approved for Residences in Tuberculosis.

TUBERCULOSIS SANATORIUMS—Continued

	Bed Capacity				Admissions														
	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total	Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants
LOUISIANA																			
State																			
Greenwell Springs Sanatorium, Greenwell Springs..	111	..	111	..	79	..	79	97	170	29	23	108	239	No	Yes	Yes	....	2	15
Private																			
Cooley Sanatorium, Monroe	48	..	48	..	Opened October 30, 1933														
Orleans Tuberculosis Hospital, New Orleans.....	100	..	100	..	122	..	122	54	176	12	36	54	..	Yes	Yes	Yes	....	5	6
Gowen Sanatorium, Shreveport	22	..	22	..	87	..	87	13	97	43	5	20	..	Yes	Yes	No	....	13	7
Pines Sanatorium, Shreveport	88	16	104	16	115	18	133	80	206	80	45	79	..	Yes	Yes	Yes	Yes	5	5
Totals.....	369	16	385	16	403	18	421	244	649	164	109	261	239	4	5	4	2	11	31
MAINE																			
State																			
Central Maine Sanatorium, Fairfield.....	186	..	186	..	173	..	173	182	359	136	40	179	11	Yes	Yes	Yes	Yes	26	6
Western Maine Sanatorium, Greenwood Mountain+	126	24	150	..	138	36	174	140	318	145	16	142	2	Yes	Yes	Yes	Yes	12	7
Northern Maine Sanatorium, Presque Isle.....	87	32	119	..	124	..	124	113	235	104	17	114	8	Yes	Yes	Yes	....	13	3
Private																			
Bangor Sanatorium, Bangor	30	..	30	..	23	1	24	19	47	23	2	17	1	Yes	Yes	Yes	Yes	3	1
Totals.....	429	56	485	..	458	37	495	454	959	413	75	452	22	4	4	4	3	51	17
MARYLAND																			
State																			
Maryland Tuberculosis Sanatorium, Henryton....	174	96	270	..	204	103	307	224	532	186	83	250	169	Yes	Yes	Yes	Yes	26	21
Maryland Tuberculosis Sanatorium, Mt. Wilson Branch, Mt. Wilson	177	..	177	..	183	13	196	176	370	150	37	182	..	Yes	Yes	Yes	Yes	16	19
Maryland Tuberculosis Sanatorium, Eastern Shore Branch, Salisbury	75	..	75	..	104	4	108	57	160	85	24	64	1	Yes	Yes	Yes	Yes	3	3
Maryland Tuberculosis Sanatorium, State Sanatorium	460	50	510	..	677	..	677	502	1,177	672	90	504	30	Yes	Yes	Yes	....	51	65
Private																			
Allegany County Tuberculosis Sanatorium, Cumberland	24	..	24	..	18	..	18	9	34	5	5	8	..	No	No	Yes	Yes	..	..
Mount Pleasant, Reisterstown	60	..	60	..	42	..	42	57	99	35	7	57	..	Yes	Yes	Yes	....	8	..
Hospital for Consumptives, Towson.....	142	90	190	..	169	65	234	191	425	227	41	212	..	Yes	Yes	Yes	....	42	6
Totals.....	1,112	194	1,306	..	1,397	185	1,582	1,216	2,797	1,321	292	1,286	200	6	6	7	4	156	111
MASSACHUSETTS																			
State																			
Lakeville State Sanatorium, Middleboro.....	125	177	302	..	125	55	180	237	413	176	13	229	..	Yes	Yes	No	Yes	24	71
North Reading State Sanatorium, North Wilmington+	..	297	297	..	..	181	181	242	432	168	15	245	..	Yes	Yes	Yes	Yes	31	41
Rutland State Sanatorium, Rutland+.....	370	..	370	..	246	..	246	340	608	242	66	335	..	Yes	Yes	Yes	Yes	42	23
Westfield State Sanatorium, Westfield.....	189	..	189	..	214	24	238	196	379	162	32	151	..	Yes	Yes	Yes	Yes	47	41
County																			
Bristol County Tuberculosis Hospital, Attleboro..	60	..	60	..	140	..	140	63	200	45	27	64	..	Yes	Yes	Yes	Yes	6	8
Hampshire County Sanatorium, Haydenville.....	100	..	100	..	87	..	87	82	165	73	27	68	..	Yes	Yes	Yes	Yes	13	..
Essex Sanatorium, Middleton	369	..	369	..	308	..	308	343	640	265	82	335	..	Yes	Yes	Yes	Yes	26	40
Norfolk County Hospital, South Braintree+	150	..	150	..	139	..	139	147	278	81	51	152	1	Yes	Yes	Yes	Yes	18	21
Plymouth County Hospital, South Hanson+	125	15	140	..	63	3	66	103	167	37	24	99	3	Yes	Yes	Yes	Yes	27	24
Middlesex County Sanatorium, Waltham+	400	..	400	..	328	..	328	372	708	274	85	349	..	Yes	Yes	Yes	Yes	19	15
Worcester County Sanatorium, Worcester.....	130	..	130	..	95	..	95	122	214	79	30	105	..	Yes	Yes	Yes	Yes	23	2
City																			
Sanatorium Division of Boston City Hospital, Boston+	616	..	616	..	529	..	529	647	1,082	372	169	529	..	Yes	Yes	Yes	Yes	91	6
Cambridge Sanatorium, Cambridge	80	..	80	..	96	..	96	50	151	51	23	42	..	No	No	Yes	Yes	6	5
Private																			
Channing Home, Boston	27	..	27	..	29	..	29	26	52	46	1	26	..	Yes	Yes	Yes	Yes	6	6
Sassaquin Sanatorium, New Bedford.....	95	21	116	..	92	9	101	106	205	85	17	103	..	Yes	Yes	Yes	Yes	4	..
Frederic S. Coolidge Memorial Hospital, Pittsfield	8	..	8	..	4	..	4	5	9	12	..	3	..	No	Yes	Yes	....	1	1
Pittsfield	14	..	14	..	12	..	12	9	22	7	3	8	..	No	Yes	Yes	....	2	..
Jewish	30	..	30	..	29	..	29	22	46	22	5	21	..	Yes	Yes	Yes	Yes	3	..
Rutland Training Center, Rutland.....	75	..	75	..	8	..	8	23	39	18	1	21	..	Yes	Yes	Yes	Yes	..	..
Rutland Cottage Sanatorium, Rutland.....	54	..	54	..	11	..	11	9	22	14	1	8	..	Yes	Yes	Yes	Yes	..	..
Balfour Sanatorium, Sharon	20	..	20	..	..	..	..	8	..	..	..	..	..	Yes	Yes	Yes	Yes	..	..
Sharon Sanatorium, Sharon	30	20	50	..	18	15	33	23	57	25	1	16	..	Yes	Yes	Yes	Yes	..	..
Totals.....	3,038	530	3,568	..	2,573	287	2,860	3,067	5,897	2,254	603	2,949	4	18	20	20	15	297	222
MICHIGAN																			
State																			
American Legion Hospital, Battle Creek+	250	..	250	..	203	..	203	217	408	197	50	205	..	Yes	Yes	Yes	....	24	29
Northern Michigan Tuberculosis Sanatorium, Gaylord	90	..	90	..	122	6	122	72	174	27	11	89	20	Yes	Yes	Yes	Yes	12	5
Michigan State Sanatorium, Howell+	400	80	480	..	252	59	291	428	728	263	47	412	..	Yes	Yes	Yes	Yes	23	..
County																			
Lenawee County Tuberculosis Sanatorium, Adrian	28	..	28	..	11	..	11	25	11	7	4	23	..	No	Yes	Yes	Yes	2	1
Calhoun County Public Hospital, Battle Creek....	75	..	75	..	65	2	68	51	112	54	9	45	5	Yes	Yes	Yes	Yes	6	..
Copper County Sanatorium, Houghton.....	53	..	53	..	32	..	32	52	84	32	6	52	15	No	Yes	Yes	Yes	17	..
Jackson County Sanatorium, Jackson.....	56	8	64	..	59	5	64	69	128	49	6	63	6	Yes	Yes	Yes	Yes	11	11
Ingham Sanatorium, Lansing+	115	..	115	..	203	3	206	84	297	150	22	108	..	Yes	Yes	Yes	Yes	14	1
Morgan Heights Sanatorium, Marquette+	55	35	90	35	92	13	105	79	175	75	21	72	..	Yes	Yes	Yes	Yes	19	1
Muskegon County Sanatorium, Muskegon.....	64	6	70	..	57	3	60	68	124	49	17	67	4	Yes	Yes	Yes	Yes	22	12
Oakland County Tuberculosis Sanatorium, Pontiac+	193	..	193	..	225	14	239	187	426	211	24	186	..	Yes	Yes	Yes	Yes	121	..
Pinecrest Sanatorium, Powers	140	..	140	..	150	4	150	106	225	71	41	132	..	Yes	Yes	Yes	Yes	..	..
Ontonagon County Sanatorium, Rockland.....	29	..	29	..	29	1	21	15	26	7	5	19	..	No	No	Yes	....	..	..
City																			
Sunshine Sanatorium, Grand Rapids.....	145	..	145	..	143	..	143	122	232	145	53	197	..	No	Yes	Yes	Yes	14	12
William H. Maybury Sanatorium, Northville+	6-3	169	843	..	513	169	673	799	1,437	562	109	763	..	Yes	Yes	Yes	....	164	6
Private																			
Bethesda Hospital, Detroit	83	..	83	..	163	..	163	76	216	94	65	76	..	Yes	Yes	Yes	Yes	8	11
Burns Home Sanatorium, Detroit.....	83	..	83	..	145	..	145	70	297	125	..	70	..	No	Yes	Yes
Chenik Hospital, Detroit	54	..	54	..	101	..	101	48	150	63	..	46	..	Yes	Yes	Yes	6	..

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TUBERCULOSIS SANATORIUMS—Continued

	Bed Capacity				Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants
	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total												
MICHIGAN—Continued																			
Detroit Tuberculosis Sanatorium, Detroit.....	120	30	150	..	207	..	207	136	339	206	28	133	..	Yes	Yes	Yes	Yes	7	11
Fairview Sanatorium, Detroit.....	66	..	66	..	71	4	75	63	141	43	32	64	..	Yes	Yes	Yes	Yes	5	8
Good Samaritan Hospital, Detroit.....	29	..	29	..	60	..	60	25	88	34	29	25	..	Yes	Yes	Yes	Yes	3	2
East Lawn Sanatorium, Northville.....	95	..	95	..	69	..	69	95	163	45	22	95	..	Yes	Yes	Yes	Yes	10	..
Pine Crest Sanatorium, Oshkemo.....	109	21	130	..	74	17	91	124	214	76	19	119	..	Yes	Yes	Yes	Yes	7	11
Wehenkel Convalescent Home, Romeo.....	40	..	40	..	92	..	92	35	125	89	2	35	..	Yes	Yes	Yes	Yes	1	4
Leland Sanatorium, Ypsilanti.....	125	..	125	..	96	..	96	85	167	66	20	81	..	Yes	Yes	Yes	Yes	3	8
Totals.....	3,271	340	3,611	35	3,211	272	3,483	3,122	6,469	2,744	605	3,102	50	20	24	25	16	359	240
MINNESOTA																			
State																			
Minnesota State Sanatorium, Ah-gwah-ching.....	480	..	480	..	421	47	468	381	516	358	101	307	6	Yes	Yes	Yes	Yes	43	36
County																			
Otter Tail County Sanatorium, Battle Lake.....	42	..	42	..	40	..	40	35	71	19	6	33	..	Yes	Yes	Yes	Yes	5	..
Mineral Springs Sanatorium, Cannon Falls.....	100	..	100	..	58	..	58	95	149	37	14	96	..	Yes	Yes	Yes	Yes	13	..
Sunnyrest Sanatorium, Crookston.....	72	..	72	..	65	1	66	66	126	58	12	56	..	Yes	Yes	Yes	Yes	9	..
Deerwood Sanatorium, Deerwood.....	26	..	26	..	26	..	26	25	51	20	1	27	1	No	Yes	Yes	Yes	4	..
Riverside Sanatorium, Oak Terrace.....	54	..	54	..	25	..	25	45	72	26	3	43	..	Yes	Yes	Yes	Yes	8	..
Sand Beach Sanatorium, Lake Park.....	46	..	46	..	14	..	14	43	59	12	2	43	2	No	Yes	Yes	Yes	6	..
Nopeming Sanatorium, Nopeming.....	220	15	235	..	156	8	164	237	403	148	23	233	8	Yes	Yes	Yes	Yes	27	15
Glen Lake Sanatorium, Oak Terrace.....	640	60	700	60	444	16	460	642	1,129	460	100	620	..	Yes	Yes	Yes	Yes	81	49
Lake Julia Tuberculosis Sanatorium, Puposky.....	57	..	57	..	58	4	62	52	117	62	7	55	..	Yes	Yes	Yes	Yes	4	4
Oakland Park Sanatorium, Thief River Falls.....	55	..	55	..	33	1	34	55	88	20	8	55	..	Yes	Yes	Yes	Yes	8	..
Buena Vista Sanatorium, Wabasha.....	30	..	30	..	25	..	25	24	47	17	4	26	..	Yes	Yes	Yes	Yes	2	2
Fair Oaks Lodge Sanatorium, Wadena.....	34	..	34	..	8	..	8	17	32	16	3	16	..	Yes	Yes	Yes	Yes	4	..
Southwestern Minnesota Sanatorium, Worthington	51	3	54	..	39	1	40	44	94	41	16	37	..	Yes	Yes	Yes	Yes	6	..
Private																			
Sarahurst, Minneapolis.....	19	..	19	..	..	..	10	..	10	..	..	..	..	Yes	Yes	Yes	Yes	..	..
Pokegama Sanatorium, Pokegama.....	34	..	34	..	31	3	34	22	59	43	6	18	..	Yes	Yes	Yes	Yes	10	..
Totals.....	1,960	78	2,038	60	1,443	81	1,524	1,783	3,323	1,337	305	1,755	17	13	15	15	10	230	106
MISSISSIPPI																			
State																			
Mississippi State Tuberculosis Sanatorium, Sanna-																			
torium.....	400	50	450	50	307	1	308	254	533	254	43	273	391	Yes	Yes	Yes	Yes	57	..
County																			
Jones County Cottage Sanatorium, Ellisville.....	20	..	20	..	..	..	17	..	17	..	3	10	..	No	No	No	....	1	..
Hinds County Tuberculosis Sanatorium, Raymond	28	..	28	..	..	..	25	..	25	..	20	20	..	No	No	No	....	..	3
Private																			
Kings Daughters Tuberculosis Hospital, Meridian..	45	..	45	..	29	..	29	25	58	12	10	17	..	Yes	No	No	Yes	1	..
Totals.....	493	50	543	50	336	1	370	279	633	266	76	320	391	2	1	1	2	59	3
MISSOURI																			
State																			
Missouri State Sanatorium, Mt. Vernon.....	677	14	691	..	846	45	891	626	1,380	542	125	681	177	Yes	Yes	Yes	Yes	21	84
County																			
Jasper County Tuberculosis Hospital, Webb City	115	..	115	..	166	..	166	115	280	121	54	115	..	Yes	Yes	Yes	....	3	7
City																			
Kansas City Tuberculosis Hospital, Kansas City..	260	..	260	..	493	3	496	192	698	218	76	194	..	Yes	Yes	Yes	Yes	34	123
Robert Koch Hospital, St. Louis.....	507	40	547	..	265	13	278	518	758	149	80	527	..	Yes	Yes	Yes	....	33	78
Private																			
Jewish Sanatorium, Robertson.....	54	32	86	32	16	35	51	40	82	51	6	31	..	Yes	Yes	Yes	Yes	1	10
Mt. St. Rose Sanatorium, St. Louis.....	135	..	135	..	206	..	206	125	329	161	45	123	15	Yes	Yes	Yes	....	20	16
Totals.....	1,748	86	1,834	32	1,992	96	2,088	1,616	3,627	1,242	386	1,671	192	6	6	6	3	112	312
MONTANA																			
State																			
Montana State Tuberculosis Sanitarium, Deer																			
Lodge.....	198	10	208	..	197	11	208	203	409	161	35	210	55	Yes	Yes	Yes	No	24	9
NEBRASKA																			
State																			
Hospital for the Tuberculous, Kearney.....	128	33	161	..	151	24	175	154	305	127	27	146	25	Yes	Yes	Yes	....	18	..
NEW HAMPSHIRE																			
State																			
New Hampshire State Sanatorium, Glencliff.....	140	..	140	..	74	..	74	107	170	58	4	103	10	Yes	Yes	Yes	Yes	12	4
Private																			
Pembroke Sanatorium, Pembroke.....	51	25	106	..	83	20	103	83	192	85	23	89	12	Yes	Yes	Yes	Yes	8	2
Totals.....	221	25	246	..	157	20	177	190	362	143	32	192	22	2	2	2	2	20	6
NEW JERSEY																			
State																			
New Jersey State Sanatorium, Glen Gardner.....	384	110	494	..	346	83	429	416	882	323	20	475	5	Yes	Yes	Yes	Yes	30	34
County																			
Allenwood Sanatorium and Monmouth County																			
Hospital for Tuberculosis, Allenwood.....	100	..	100	..	99	7	106	98	197	62	42	..	..	Yes	Yes	Yes	....	10	1
Lakeland Sanatorium, Greenglo.....	165	75	240	75	182	76	258	220	475	215	37	203	1	Yes	Yes	Yes	....	26	4
Hudson County Tuberculosis Hospital, Jersey City.....	500	..	500	..	599	..	599	374	946	346	184	416	..	Yes	Yes	Yes	Yes	65	80
Roosevelt Hospital, Metuchen.....	217	4	221	..	220	7	227	213	501	202	64	214	..	Yes	Yes	Yes	Yes	31	2
Shonburn Mountain Sanatorium, Morristown.....	52	..	52	..	42	..	42	52	93	35	7	52	8	Yes	Yes	Yes	Yes	2	7
Fairview Sanatorium, New Lisbon.....	120	..	120	..	99	..	99	106	200	69	34	106	..	Yes	Yes	Yes	....	12	1
Atlantic County Hospital for Tuberculous Dis-																			
eases, Northfield.....	50	..	50	..	53	2	55	49	102	27	27	50	14	Yes	Yes	Yes	Yes	5	3
Valley View Sanatorium, Paterson.....	231	..	231	..	235	..	235	223	471	186	64	228	8	Yes	Yes	Yes	Yes	29	..

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TUBERCULOSIS SANATORIUMS—Continued

	Bed Capacity				Admissions			Daily Average	Patients Treated	Patients Discharged ^a	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants	
	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total													
NEW JERSEY—Continued																				
Bonnie Burn Sanatorium, Scotch Plains.....	256	151	407	114	267	156	423	355	738	322	90	326	20	Yes	Yes	Yes	Yes	..	..
Hudson County Tuberculosis Sanatorium, Secaucus	210	..	210	..	191	..	191	207	398	135	52	207	..	Yes	Yes	Yes	Yes	21	..	
Essex Mountain Sanatorium, Verona ⁺	446	..	446	..	503	..	503	418	901	254	222	425	42	Yes	Yes	Yes	Yes	45	..	
Private																				
Brown Mills Nursing Cottage, Brown Mills.....	58	..	58	..	38	..	38	30	38	28	11	..	..	No	Yes	Yes	Yes	5	1
Deborah Sanatorium, Brown Mills.....	56	..	56	..	61	..	61	43	105	46	2	44	110	Yes	Yes	Yes	Yes	4	..	
Manor Nursing Cottage, Brown Mills.....	39	..	39	..	18	..	18	40	52	10	4	36	..	No	No	No	Yes	3	1	
Sycamore Hall Sanatorium, Brown Mills.....	33	..	33	..	23	..	23	25	47	3	11	23	..	..	..	..	Yes	..	..
Idlease Sanatorium, Newfoundland	50	..	50	..	33	..	33	27	62	27	5	23	..	Yes	Yes	Yes	Yes	3	1	
Totals.....	2,967	340	3,307	189	3,099	331	3,430	2,896	6,208	2,292	876	2,833	208	14	15	17	10	315	12	
NEW MEXICO																				
Federal																				
Albuquerque Indian Sanatorium, Albuquerque....	80	20	100	..	66	28	94	89	169	96	12	80	..	Yes	Yes	Yes	Yes	11	17	
Jicarillo Indian Sanatorium, Dulce.....	..	56	56	..	..	53	53	42	106	14	..	43	..	Yes	Yes	Yes	Yes	6	2
U. S. Marine Hospital, Ft. Stanton.....	244	..	244	..	167	..	167	173	345	56	14	208	..	Yes	Yes	Yes	Yes	10	11	
State																				
State Tuberculosis Sanatorium, Socorro.....	65	..	65	..	65	..	65	58	122	104	31	65	15	Yes	Yes	Yes	Yes	4	3	
Private																				
Ahepa Silver District Sanatorium, Albuquerque....	46	..	46	..	78	..	78	42	115	22	1	46	7	Yes	Yes	Yes	Yes	4	..	
Methodist Sanatorium, Albuquerque	65	..	65	..	75	..	75	46	120	67	10	43	..	No	No	No	Yes	6	..	
Valmora Sanatorium, Valmora	70	5	75	..	106	1	107	42	149	62	5	44	..	Yes	Yes	Yes	Yes	3	4	
Totals.....	570	81	651	..	557	82	639	492	1,146	421	73	529	22	6	6	7	4	44	42	
NEW YORK																				
Federal																				
Veterans Administration Facility, Castlepoint....	479	..	479	..	673	..	673	463	1,146	522	144	461	18	Yes	Yes	Yes	Yes	51	53	
Veterans Administration Facility, Sunmount.....	320	..	320	..	507	..	507	392	849	337	74	426	..	Yes	Yes	Yes	Yes	46	61	
State																				
Hermann M. Biggs Memorial Hospital, Ithaca ⁺ ...	200	50	250	..	209	23	232	171	370	87	24	186	..	Yes	Yes	Yes	Yes	47	75	
Mount Morris Tuberculosis Hospital, Mt. Morris ⁺	200	50	250	..	196	5	201	188	352	230	24	206	..	Yes	Yes	Yes	Yes	32	15	
Homer Folks Tuberculosis Hospital, Oneonta ⁺ ...	200	50	250	..	238	25	263	231	495	187	38	224	..	Yes	Yes	Yes	Yes	23	15	
New York State Hospital, Ray Brook.....	300	..	300	..	364	..	364	281	640	350	5	281	40	Yes	Yes	Yes	Yes	20	..	
County																				
Montgomery Sanatorium, Amsterdam	60	12	72	12	138	22	160	67	233	67	15	73	..	Yes	Yes	Yes	Yes	6	3	
Newton Memorial Hospital, Cassadaga.....	120	60	180	..	93	28	121	173	290	100	15	173	16	Yes	Yes	Yes	Yes	17	..	
Broome County Tuberculosis Hospital, Chenango	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bridge	78	42	120	42	67	14	81	90	165	65	12	87	1	Yes	Yes	Yes	Yes	11	4	
Delaware County Tuberculosis Sanatorium, Delhi.	28	4	32	2	31	11	42	22	62	34	4	24	..	No	Yes	Yes	Yes	3	1	
Chemung County Sanatorium, Elmira.....	44	..	44	..	53	..	53	39	85	34	10	41	2	No	Yes	Yes	Yes	4	..	
Nassau County Sanatorium, Farmingdale.....	314	102	416	102	243	163	406	355	881	364	100	317	..	Yes	Yes	Yes	Yes	45	5	
Westmount Sanatorium, Glens Falls.....	40	8	48	8	29	2	31	50	79	29	3	48	..	Yes	Yes	Yes	Yes	4	..	
Oak Mount Sanatorium, Holcomb ³	39	6	45	..	22	3	25	21	49	23	6	20	..	No	Yes	Yes	Yes	15	..	
Suffolk Sanatorium, Holtsville.....	98	64	162	..	67	53	120	159	272	92	26	154	..	Yes	Yes	Yes	Yes	6	7	
Ulster County Tuberculosis Hospital, Kingston....	56	..	56	..	80	..	80	52	123	57	15	66	2	Yes	Yes	Yes	Yes	20	4	
Niagara Sanatorium, Lockport.....	120	80	200	..	96	54	150	186	330	111	40	179	4	Yes	Yes	Yes	Yes	6	2	
Saratoga County Tuberculosis Hospital, Middle-	60	..	60	..	66	3	69	52	116	50	15	50	2	Yes	Yes	Yes	Yes	4	..	
grove	26	..	26	..	29	1	30	18	48	25	2	21	9	No	Yes	Yes	Yes	4	..	
Otsego County Tuberculosis Hospital, Middle-	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Estelle	50	..	50	..	36	..	36	49	83	19	13	51	4	Yes	Yes	Yes	Yes	6	2	
for Tuberculosis, Newburgh	40	..	40	..	57	2	59	34	87	38	11	38	1	No	Yes	Yes	Yes	9	..	
Rocky Crest Sanatorium, Olean.....	48	28	76	28	54	5	59	54	106	30	15	54	..	Yes	Yes	Yes	Yes	11	5	
Columbia Sanatorium, Philmont.....	88	..	88	..	82	..	82	77	154	59	10	78	..	Yes	Yes	Yes	Yes	10	5	
Summit Park Sanatorium, Pomona.....	75	30	105	..	55	33	88	94	179	71	18	91	1	Yes	Yes	Yes	Yes	10	5	
Oswego County Sanatorium, Richland.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Iola-Monroe County Tuberculosis Sanatorium,	270	130	400	64	340	74	414	387	830	276	80	335	14	Yes	Yes	Yes	Yes	55	2	
Rochester ⁺	62	28	90	..	42	20	62	88	154	56	18	80	7	Yes	Yes	Yes	Yes	11	..	
Pine Crest Sanatorium, Salisbury Center.....	122	4	126	..	94	13	107	126	234	83	25	123	5	Yes	Yes	Yes	Yes	21	11	
Schenectady County Tuberculosis Hospital, Sche-	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
nectady	33	..	33	..	23	1	24	28	55	25	5	25	..	No	Yes	Yes	Yes	3	1	
Chenango County Tuberculosis Hospital, Sher-	205	50	255	..	156	26	182	243	417	133	44	246	5	Yes	Yes	Yes	Yes	21	7	
burne	134	54	188	..	125	41	166	173	330	93	28	170	..	Yes	Yes	Yes	Yes	9	3	
Onondaga Sanatorium, Syracuse.....	58	20	78	..	74	37	111	66	181	110	7	64	..	Yes	Yes	Yes	Yes	15	..	
Onida County Tuberculosis Sanatorium, Utica....	118	34	152	..	119	19	138	142	270	105	26	137	..	Yes	Yes	Yes	Yes	15	..	
Jefferson County Sanatorium, Watertown ⁺	
Pawling Sanatorium, Wyanetskill	393	..	393	..	707	..	707	374	1,032	687	1	364	..	Yes	Yes	Yes	Yes	37	12	
City	424	58	482	..	303	66	369	435	810	320	42	448	..	Yes	Yes	Yes	Yes	25	25	
Municipal Sanatorium, Otisville ⁺	120	120	..	..	91	91	100	186	50	2	124	..	No	Yes	Yes	Yes	11	20	
J. N. Adams Memorial Hospital, Perryburg.....	1,244	..	1,244	..	1,611	179	1,790	1,692	3,261	1,033	601	1,678	103	Yes	Yes	Yes	Yes	423	20	
Neponsit Beach Hospital for Children, Rockaway	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Beach	55	..	55	..	55	..	55	50	103	51	26	53	..	No	Yes	Yes	Yes	6	1	
Sea View Hospital, Staten Island ⁺	
Gray Oaks Hospital, Yonkers.....	79	50	129	50	73	46	119	125	245	111	14	125	..	Yes	Yes	Yes	Yes	5	2	
City-County .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Samuel W. Bowne Memorial Hospital, Poughkeepsie	230	..	230	..	267	..	267	223	498	266	5	227	19	Yes	Yes	Yes	Yes	23	21	
Private	114	9	123	..	132	12	144	118	250	110	23	120	15	Yes	Yes	Yes	Yes	12	..	
Brooklyn Thoreau Hospital, Brooklyn.....	128	..	128	..	60	..	60	56	102	40	5	57	..	Yes	Yes	Yes	Yes	22	..	
Sanatorium Gabriels, Gabriels.....	129	16	145	..	112	1	113	127	229	112	5	122	..	Yes	Yes	Yes	Yes	1	4	
Stony Wold Sanatorium, Lake Kushkaqua.....	111	..	111	..	94	..	94	47	147	107	5	24	..	Yes	Yes	Yes	Yes	1	..	
Workmen's Circle	55	..	55	..	38	..	38	55	92	38	..	55	8	Yes	Yes	Yes	Yes	15	..	
Potts Memorial .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nazareth Hospital	170	80	250	..	202	81	283	246	620	214	65	246	20	No	No	Yes	Yes	15	..	
Yonkers City .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Joseph's Hospital for Consumptives, New	270	..	270	..	298	..	298	258	695	279	141	275	..	Yes	Yes	Yes	Yes	16	..	
York City	255	..	255	..	296	..	296	254	546	266	65	255	..	Yes	Yes	Yes	Yes	17	..	
Seton Hospital, New York City.....	45	..	45	..	25	..	25	31	63	29	5	33	..	No	Yes	Yes	Yes	5	..	
St. John's Hospital, Ogdensburg.....	10	..	10	..	..	..	..	9	..	..	..	..	..	..	..	..	..	..	..
Sunnyside Health Farm, Otisville.....	51	..	51	..	168	..	168	31	149	122	11	26	..	Yes	Yes	Yes	Yes	9	..	
Samuel and Nettie Bowne Hospital, Poughkeepsie.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Admissions

[illegible]

TUBERCULOSIS SANATORIUMS—Continued

OKLAHOMA—Continued																				
		Bed Capacity				Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants
Private	Farm	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total												
Farm Sanatorium, Oklahoma City.....		25	..	25	..	111	..	111	14	124	96	13	10	..	No	No	Yes	..	4	..
Totals.....		852	80	932	70	1,293	206	1,499	797	2,274	1,272	174	803	171	4	4	5	4	25	65
OREGON																				
State																				
Oregon State Tuberculosis Hospital, Salem.....		289	36	325	36	181	33	214	327	540	200	35	323	36	Yes	Yes	Yes	Yes	23	9
Eastern Oregon State Tuberculosis Hospital, The Dalles		200	..	200	..	133	3	136	153	287	88	25	174	11	Yes	Yes	Yes	Yes	23	15
County																				
Multnomah County Tuberculosis Pavilion, Troutdale		41	..	41	..	82	..	82	33	123	73	17	30	..	No	No	Yes	..	5	..
Private																				
Portland Open Air Sanatorium, Milwaukee.....		40	..	40	..	123	3	126	28	165	95	13	30	..	Yes	Yes	Yes	..	6	3
Totals.....		570	36	606	36	519	39	558	541	1,115	456	90	562	47	3	3	4	2	57	23
PENNSYLVANIA																				
State																				
Hamburg State Sanatorium for Tuberculosis, Hamburg		540	..	540	..	508	..	508	516	1,040	382	136	518	249	Yes	Yes	Yes	..	32	62
Pennsylvania State Tuberculosis Sanatorium No. 1, South Mountain		788	216	1,004	216	486	317	803	969	1,747	767	48	933	322	Yes	Yes	Yes	Yes	20	15
Pennsylvania State Tuberculosis Sanatorium No. 2, State		570	270	840	..	343	290	633	803	1,403	493	95	820	..	Yes	Yes	Yes	Yes	60	22
County																				
Erie County Tuberculosis Hospital, Erie.....		66	..	66	..	98	..	98	62	98	28	9	61	4	Yes	Yes	Yes	Yes	6	9
Beaver County Sanatorium, Monaca.....		62	..	62	..	76	..	76	62	138	63	15	62	6	Yes	Yes	Yes	..	5	6
Berks County Tuberculosis Sanatorium, Reading..		84	50	134	..	134	..	134	131	267	98	43	135	10	Yes	Yes	Yes	..	14	..
Lackawanna County Tuberculosis Hospital, Scranton		120	30	150	30	88	24	112	148	260	59	46	148	10	Yes	No	Yes	..	8	10
City																				
Leech Farm Sanatorium, Pittsburgh.....		255	45	300	..	361	50	411	280	685	266	131	287	24	No	Yes	Yes	..	23	..
City-County																				
Rossmore Sanatorium, Lancaster		55	2	57	..	101	..	101	52	154	77	24	55	4	No	Yes	Yes	..	6	..
Private																				
DeVitt's Camp, Allenwood		108	..	108	..	220	..	220	90	322	214	8	105	3	Yes	Yes	Yes	Yes	15	..
Eagleville Sanatorium for Consumptives, Eagleville+		188	..	188	..	172	5	177	176	341	158	14	169	59	Yes	Yes	Yes	Yes	25	9
Grand View Institution, Oil City.....		50	..	50	..	57	1	58	19	81	55	2	22	..	Yes	Yes	Yes	Yes	5	..
Home for Consumptives, Philadelphia.....		79	25	104	..	87	28	115	91	196	79	29	89	..	Yes	Yes	Yes	..	8	12
Rush Hospital for Consumption and Allied Diseases, Philadelphia		89	55	144	34	428	..	428	110	534	311	45	117	35	No	Yes	Yes	..	21	2
Tuberculosis League Hospital, Pittsburgh.....		150	..	150	..	206	6	212	140	348	180	24	144	60	Yes	Yes	Yes	Yes	6	15
White Haven Sanatorium, White Haven+.....		250	..	250	..	308	1	309	203	503	232	80	190	..	Yes	Yes	Yes	..	51	13
Totals.....		3,454	693	4,147	280	3,673	722	4,483	3,852	8,210	3,462	749	3,835	786	13	15	16	7	227	150
RHODE ISLAND																				
State																				
State Sanatorium, Wallum Lake+.....		548	82	630	..	348	16	364	466	779	190	87	502	..	Yes	Yes	Yes	Yes	41	53
Private																				
St. Joseph's Sanatorium, Hills Grove.....		75	..	75	..	16	..	16	35	52	9	10	33	..	No	No	..	..	4	2
Totals.....		623	82	705	..	364	16	380	501	831	199	97	535	..	1	1	1	1	45	57
SOUTH CAROLINA																				
State																				
South Carolina Sanatorium, State Park.....		394	46	440	..	..	30	551	426	928	351	149	413	..	Yes	Yes	Yes	..	29	55
County																				
Florence-Darlington Tuberculosis Sanatorium, Florence		71	..	71	..	104	..	104	66	165	60	26	69	12	Yes	Yes	Yes	Yes	6	6
Greenville County Tuberculosis Sanatorium, Greenville		65	16	81	12	90	26	116	77	191	122	14	76	3	Yes	Yes	Yes	..	11	4
Pinchaven Sanatorium, Navy Yard.....		60	..	60	..	118	7	125	60	183	76	101	65	6	Yes	Yes	Yes	..	8	..
City-County																				
Camp Alice, Sumter County Tuberculosis Sanatorium, Sumter		26	..	26	..	47	..	47	22	63	4	4	19	..	No	No	No	..	..	..
Private																				
Ridgewood Tuberculosis Camp, Columbia.....		70	..	70	..	75	..	75	44	121	45	19	35	13	No	No	Yes	Yes	5	..
Totals.....		656	62	718	12	424	63	1,016	695	1,651	658	313	677	24	4	4	5	2	13	65
SOUTH DAKOTA																				
Federal																				
Sioux Sanatorium, Rapid City.....		112	..	112	..	..	..	119	101	205	22	..	101	40	Yes	Yes	Yes	Yes	21	16
State																				
South Dakota State Sanatorium for Tuberculosis, Sanator		192	..	192	..	134	4	138	148	569	156	22	167	..	Yes	Yes	Yes	..	15	3
Totals.....		304	..	304	..	134	4	257	249	574	158	22	268	40	2	2	2	1	23	19
TENNESSEE																				
County																				
Davidson County Tuberculosis Hospital, Nashville+		250	59	309	..	210	65	275	232	511	219	53	234	32	Yes	Yes	Yes	Yes	26	13
City-County																				
Beverly Hills Sanatorium, Knoxville.....		135	25	160	..	120	21	141	116	265	89	41	121	..	Yes	Yes	Yes	Yes	15	23
Oakville Memorial Sanatorium, Oakville.....		260	99	359	..	230	66	296	245	621	..	61	232	..	Yes	Yes	Yes	Yes	26	..
Private																				
Pine Breeze Sanatorium, Chattanooga+.....		175	100	275	..	160	53	213	211	443	124	69	217	20	Yes	Yes	Yes	Yes	15	17
International Printing Pressmen and Assistant's Union Sanatorium, Pressmen's Home.....		69	..	69	..	..	..	14	..	14	..	..	..	..	Yes	Yes	Yes	..	2	..
Watauga Sanitarium, Ridgeway		49	..	49	..	40	..	40	16	61	45	2	17	..	No	Yes	Yes	..	2	..
Totals.....		929	265	1,195	..	709	295	979	959	1,915	457	223	931	52	5	6	6	4	57	55

1. Included in beds for children. 2. Does not include deaths. + Approved for Residences in Tuberculosis.

TEXAS

TEXAS																				
State	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total	Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants	
Kerrville State Sanatorium, Kerrville.....	162	10	172	..	296	15	311	116	410	242	47	163	20	Yes	Yes	Yes	..	8	..	
State Tuberculosis Sanatorium, Sanatorium.....	703	163	866	162	2,026	358	2,384	827	3,232	2,348	28	854	249	Yes	Yes	Yes	..	80	..	
County																				
Jefferson County Tuberculosis Hospital, Beaumont.....	61	24	85	24	110	33	143	84	217	105	19	91	2	Yes	Yes	Yes	..	9	..	
Beaumont County Tuberculosis Hospital, Unit 2, Beaumont.....	22	..	22	..	37	2	39	51	61	18	12	21	17	Yes	Yes	Yes	..	8	9	
Bexar County Tuberculosis Colony, Southton.....	75	..	75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
City-County																				
Woodlawn Hospital, Dallas.....	118	..	118	..	186	4	190	98	290	132	71	96	7	Yes	Yes	Yes	..	16	..	
Elmwood Sanatorium, Fort Worth.....	66	..	66	..	27	..	27	54	91	18	11	56	21	No	No	No	..	4	..	
Houston Tuberculosis Hospital, Houston.....	122	50	172	50	291	153	444	160	597	335	54	158	..	Yes	Yes	Yes	..	7	9	
Private																				
Hendricks-Laws Sanatorium, El Paso.....	70	..	70	..	48	..	48	12	63	33	4	11	..	Yes	Yes	Yes	..	5	..	
Long Sanatorium, El Paso.....	50	..	50	..	54	2	56	17	74	37	11	25	..	Yes	Yes	Yes	..	7	..	
Price Sanatorium, El Paso.....	20	..	20	..	99	1	100	29	136	90	8	26	..	Yes	Yes	Yes	..	2	..	
Mountain View Sanatorium, El Paso.....	75	..	75	..	54	..	54	12	63	33	4	11	..	Yes	Yes	Yes	..	5	..	
Sunnyvale Sanatorium, Kerrville.....	35	..	35	..	57	..	57	20	77	33	6	15	..	Yes	Yes	Yes	..	1	..	
Dr. Farmer's Sanatorium, San Antonio.....	20	..	20	..	15	..	15	7	24	8	..	11	..	Yes	Yes	Yes	..	1	..	
Grace Lutheran Sanatorium for Tuberculosis, San Antonio.....	35	..	35	..	97	..	97	27	120	71	..	26	..	Yes	Yes	Yes	..	1	..	
Woodmen of the World War Memorial Hospital, San Antonio.....	27	..	27	..	26	..	26	17	45	25	20	93	25	Yes	Yes	Yes	..	9	8	
San Antonio.....	150	150	179	..	568	4,327	1,696	6,060	3,753	335	1,763	343	12	12	16	2	151	53	1	
Von Ormy Cottage Sanatorium, Von Ormy.....	27	..	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals.....	1,831	246	2,077	236	3,587	568	4,327	1,696	6,060	3,753	335	1,763	343	12	12	16	2	151	53	
UTAH																				
Utah State Tuberculosis Sanatorium, Ogden.....	96	..	96	..	59	..	59	40	93	23	25	45	..	Yes	Yes	Yes	..	3	6	
VERMONT																				
Washington County Sanatorium, Barre.....	47	..	47	..	102	4	106	70	179	120	10	59	2	Yes	Yes	Yes	..	5	2	
Vermont Sanatorium, Pittsford.....	80	..	80	..	161	4	165	110	272	143	44	104	10	2	2	2	8	8	8	
Totals.....	127	..	127	..	262	..	266	180	451	263	54	169	12	2	2	2	12	13	11	
VIRGINIA																				
Piedmont Sanatorium, Burkeville.....	150	..	150	..	232	..	232	142	370	177	65	149	Yes	Yes	Yes	Yes	22	3	..	
Catawba Sanatorium, Catawba Sanatorium.....	340	..	340	..	460	331	794	397	61	334	50	Yes	Yes	Yes	Yes	..	33	7	..	
Blue Ridge Sanatorium, Charlottesville.....	230	40	270	40	325	69	394	263	632	354	30	267	..	Yes	Yes	Yes	..	36	8	
City																				
Pine Camp Hospital, Brook Hill.....	222	64	286	..	177	30	207	200	401	118	69	200	..	Yes	Yes	Yes	..	28	..	
Charles R. Grandy Sanatorium, Norfolk.....	100	..	100	..	103	..	103	87	193	62	56	90	..	No	Yes	Yes	..	8	..	
Hilltop Sanatorium, Danville.....	40	20	60	20	75	50	125	35	200	40	7	72	..	No	Yes	Yes	..	6	..	
Tidewater Memorial Hospital, Lynnhaven.....	50	..	50	..	101	..	101	50	151	95	41	50	19	Yes	Yes	Yes	..	4	..	
Mount Regis Sanatorium, Salem.....	20	..	20	..	48	..	48	12	58	39	1	19	3	Yes	Yes	Yes	..	4	..	
Totals.....	1,152	124	1,276	60	1,061	139	1,200	1,129	2,819	1,272	320	1,181	220	6	8	8	5	141	26	
WASHINGTON																				
Federal																				
County																				
Yakima Sanatorium, Toppenish.....	37	..	37	..	47	..	47	32	110	8	8	32	..	Yes	Yes	Yes	..	4	3	
Oakhurst Sanatorium, Elma.....	51	14	65	11	62	29	91	65	159	87	10	63	7	Yes	Yes	Yes	..	7	..	
Mountain View Sanatorium, Lakewood.....	110	30	140	..	110	32	142	128	284	193	..	118	3	No	Yes	Yes	..	12	..	
King County Tuberculosis Hospital, Seattle.....	160	..	160	..	141	141	141	141	300	90	..	54	..	Yes	Yes	Yes	..	25	..	
Aldercrest Sanatorium, Snohomish.....	57	..	57	..	52	..	52	..	107	44	13	55	5	Yes	Yes	Yes	..	8	..	
Edgell Sanatorium, Spokane.....	125	22	147	..	85	9	94	117	217	83	25	109	..	Yes	Yes	Yes	..	4	..	
Blue Mountain Sanatorium, Walla Walla.....	30	6	36	..	38	8	46	32	77	45	3	31	..	Yes	Yes	Yes	..	4	..	
Private																				
Laurel Bench Sanatorium, Seattle.....	80	5	85	..	174	4	178	77	258	153	23	82	..	Yes	Yes	Yes	..	10	13	
Riverton Sanatorium, Seattle.....	50	..	50	..	48	2	50	48	102	45	18	47	..	Yes	Yes	Yes	..	10	1	
Totals.....	700	77	777	14	757	85	842	603	1,614	748	154	602	15	8	9	9	6	80	22	
WEST VIRGINIA																				
Pinecrest Sanitarium, Beckley.....	148	..	148	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Denmar Sanatorium, Denmar.....	86	14	100	..	102	13	115	97	165	700	223	..	..	..	..	..	..	..	..
Hopemont Sanitarium, Hopemont.....	440	35	475	..	295	19	314	476	..	..	..	..	..	..	..	..	..	..	..
County																				
Grandview Sanatorium, Moundsville.....	30	..	30	..	32	2	34	23	59	24	6	24	..	No	No	Yes	..	4	1	
Ohio County Tuberculosis Sanatorium, Wheeling.....	38	..	38	..	21	..	21	38	59	13	..	38	..	Yes	Yes	Yes	..	4	3	
Private																				
Hill Crest Sanatorium, Charleston.....	42	..	42	..	46	..	46	41	88	40	..	43	..	No	No	Yes	..	5	..	
Eastmont Tuberculosis Sanatorium, Morgantown.....	240	..	240	..	122	..	122	205	322	93	..	323	3	4	5	1	87	55	..	
Totals.....	772	90	862	39	593	78	676	840	1,411	318	93	806	323	..	..	..	..	..	..
WISCONSIN																				
Lake Tomahawk State Camp, Lake Tomahawk.....	42	..	42	..	46	..	46	41	88	40	..	43	..	No	No	Yes	..	5	..	
Wisconsin State Sanatorium, Statesant.....	158	..	158	..	122	..	122	205	322	93	..	323	3	4	5	1	87	55	..	
County																				
Mt. Washington Sanatorium, Eau Claire.....	91	..	91	..	101	84	185	51	17	89	3	Yes	Yes	Yes	Yes	..	13	18	..	
Middle River Sanatorium, Hawthorne.....	64	..	64	..	82	4	86	66	147	79	13	63	2	Yes	Yes	Yes	..	21	..	
Pinehurst Sanatorium, Janesville.....	52	..	52	..	46	..	46	50	100	57	12	53	..	Yes	Yes	Yes	..	7	..	
Forest Lawn Sanatorium, Jefferson.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1. Included in beds for children. 2. Does not include deaths. 3. Closed May 1, 1930. 4. Austin-Travis County Sanatorium, Austin; opened Feb. 1, 1940; 45 beds. 5. Roanoke City Tubercular Sanatorium, Roanoke; opened Jan. 1, 1940; 69 beds. 6. Carman Sanatorium, Dallas; 20 beds.																				

TUBERCULOSIS SANATORIUMS—Continued

County	Bed Capacity				Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics	Nurses	Attendants ³
	Adults	Children	Total	Preventorium Beds ¹	Adults	Children	Total												
WISCONSIN—Continued																			
Riverview Sanatorium, Kaukauna	56	9	65	..	116	7	125	58	183	64	17	57	2	Yes	Yes	Yes	Yes	10	5
Willowbrook Sanatorium, Kenosha	66	6	72	6	45	6	51	46	87	31	10	49	2	Yes	Yes	Yes	Yes	17	6
Lake View Sanatorium, Madison	128	12	140	..	98	..	98	136	232	71	19	136	6	Yes	Yes	Yes	Yes	17	3
Oak Forest Sanatorium, Onalaska	66	..	66	..	55	..	55	64	121	26	13	67	6	Yes	Yes	Yes	Yes	12	..
Oak Sanatorium, Pewaukee	42	..	42	..	55	..	55	40	96	55	5	35	3	Yes	Yes	Yes	Yes	5	1
Rocky Knoll Sanatorium, Plymouth	75	15	90	..	47	9	56	92	149	46	9	94	1	Yes	Yes	Yes	Yes	5	1
Pureair Sanatorium, Pureair	70	..	70	..	72	2	74	63	142	75	14	63	3	Yes	Yes	Yes	Yes	5	6
Sunny Rest Sanatorium, Racine	55	..	55	..	92	4	96	67	151	31	7	58	3	Yes	Yes	Yes	Yes	5	4
Mount View Sanatorium, Wausau	66	..	66	..	73	5	78	64	142	77	11	68	2	Yes	Yes	Yes	Yes	12	4
Muirdale Sanatorium, Wauwatosa ⁴	447	53	500	..	590	122	718	452	1,146	483	150	465	..	Yes	Yes	Yes	Yes	13	31
Hickory Grove Sanatorium, West DePere	98	8	106	..	..	..	106	98	106	..	12	96	5	Yes	Yes	Yes	Yes	9	1
Maplecrest Sanatorium, Whitelaw	50	..	50	..	109	..	109	48	159	61	8	48	2	Yes	Yes	Yes	Yes	8	1
Sunny View Sanatorium, Winnebago	79	17	96	17	70	30	100	92	193	90	9	95	7	Yes	Yes	Yes	Yes	8	1
Private																			
Morningside Sanatorium, Madison	20	30	50	30	23	10	33	46	81	37	5	33	..	Yes	Yes	Yes	Yes	7	1
River Pines Sanatorium, Stevens Point	62	..	62	..	73	..	73	60	126	54	11	66	..	Yes	Yes	Yes	Yes	5	3
Totals.....																			
2,010 154 2,164 53 2,003 206 2,317 1,997 4,140 1,573 371 2,037 60 20 20 20 12 24 131																			
WYOMING																			
State																			
Wyoming Tuberculosis Sanatorium, Basin.....	33	..	33	..	58	..	58	26	81	59	8	26	..	Yes	Yes	Yes	Yes	4	..

TUBERCULOSIS-ISOLATION HOSPITALS

State	Control	Total Capacity	TB Beds			Preventorium Beds	Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics
			Adults	Children	Total		Adults	Children	Total										
CONNECTICUT																			
Englewood Hospital, Bridgeport.....	City	150	42	..	42	..	86	4	90	23	109	89	19	23	..	No	No	Yes	..
Municipal Hospital, Greenwich.....	City	73	16	..	16	..	16	..	16	4	17	9	2	5	..	Yes	No	Yes	..
MASSACHUSETTS																			
Board	City	55	30	..	30	..	46	..	46	27	62	22	6	23	..	Yes	Yes	Yes	Yes
Lowell	City	94	60	..	60	..	61	2	63	..	112	37	30	..	..	Yes	Yes	Yes	..
Malden	City	50	14	..	14	..	..	..	..	8	..	26	1	4	..	No	No	No	..
Barnstable	County	48	30	..	30	..	..	..	43	52	89	..	43	46	..	Yes	Yes	Yes	Yes
Somerville Contagious Disease Hospital, Somerville	City	40	3	20	23	20	8	..	8	1	10	5	1	..	..	No	No	No	..
Health Department Hospitals, Springfield	City	100	56	..	56	..	83	..	83	48	126	54	19	53	3	Yes	Yes	Yes	Yes
Belmont Hospital, Worcester+.....	City	250	113	12	125	12	151	17	168	94	280	143	43	96	..	Yes	Yes	Yes	Yes
MICHIGAN																			
Herman Kiefer Hospital, Detroit+....	City	1,335	810	..	810	..	1,441	17	1,458	796	2,242	1,134	311	707	..	Yes	Yes	Yes	..
Fairmount Hospital, Kalamazoo.....	County	140	70	5	75	..	56	4	60	50	114	53	13	48	..	Yes	Yes	Yes	Yes
Saginaw County Hospital, Saginaw..	County	175	110	10	120	..	112	7	119	104	216	69	31	117	..	Yes	Yes	Yes	Yes
MISSOURI																			
City Isolation Hospital, St. Louis+...	City	225	60	..	60	..	149	5	154	51	203	..	19	54	230	Yes	Yes	Yes	..
MONTANA																			
Detention Hospital, Great Falls.....	CyCo	25	8	..	8	..	3	..	3	..	3	3	..	..	..	No	No	..	..
NEW JERSEY																			
Essex County Hospital for Contagious Diseases, Belleville.....	County	540	...	30	30	..	...	22	22	16	41	17	7	17	..	Yes	Yes	Yes	..
Paterson City Hospital, Paterson....	City	115	40	..	40	..	53	..	53	20	69	27	10	22	..	No	No	Yes	..
"Bergen Pines" Bergen County Hospital, Ridgewood	County	500	294	60	354	60	223	37	265	278	534	169	75	290	1	Yes	Yes	Yes	Yes
Trenton Municipal Hospital, Trenton	City	375	101	..	101	..	...	..	174	70	251	82	59	77	..	Yes	Yes	Yes	..
NEW YORK																			
Kingston Avenue Hospital, Brooklyn+	City	510	72	..	72	..	162	..	162	70	220	144	10	71	..	Yes	Yes	Yes	Yes
Riverside Hospital, New York City....	City	332	284	..	284	..	537	..	537	343	906	316	222	347	..	Yes	Yes	Yes	..
Willard Parker Hospital, New York City	City	424	123	..	123	..	291	..	291	120	423	269	37	126	..	Yes	Yes	Yes	..
Niagara Falls Municipal Hospital, Niagara Falls	City	33	..	..	..	..	..	..	4	..	4	3	1	..	..	No	..	..	..
Schenectady City Hospital, Schenectady	City	35	..	..	..	..	13	2	15	..	15	12	3	2	..	Yes	Yes	Yes	..
PENNSYLVANIA																			
Philadelphia Hospital for Contagious Diseases, Philadelphia	City	1,000	..	25	25	..	..	7	7	9	16	5	5	6	..	Yes	Yes	No	..
RHODE ISLAND																			
Charles V. Chapin Hospital, Providence	City	265	60	..	60	..	123	3	131	45	173	74	31	45	..	Yes	Yes	Yes	Yes
WASHINGTON																			
Firland Sanatorium and Isolation Hospital, Richmond Highlands.....	City	250	200	50	250	50	120	..	120	219	243	120	20	212	..	Yes	Yes	Yes	Yes
Totals.....																			
		7,144	2,691	212	2,413	112	3,764	127	4,112	2,445	6,592	2,872	1,015	2,451	254	19	19	21	19

1. Included in beds for children. 2. Does not include deaths. + Approved for Residences in Tuberculosis.

TUBERCULOSIS DEPARTMENTS OF GENERAL HOSPITALS
(TWENTY-FIVE BEDS AND OVER)

HOSPITALS																	
Beds and Over																	
	Total Capacity	TB Beds		Total Preventorium Beds	Admissions			Daily Average	Patients Treated	Patients Discharged	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics
		Adults	Children		Adults	Children	Total										
ALABAMA																	
Federal Veterans Admin. Facility, Tuscaloosa.....	346	27	...	27	67	...	67	24	87	50	13	24	..	Yes	Yes	Yes	Yes
ARIZONA																	
Federal Southern Navajo General Hospital and Sanatorium, Fort Defiance.....	226	90	10	100	...	...	...	...	...	...	...	...	...	...	...	...	...
Veterans Admin. Facility, Tucson.....	358	252	...	232	...	...	...	...	...	...	...	...	...	...	...	...	...
County Veterans Admin. Facility, Whipple.....	553	144	...	144	...	...	...	...	...	...	...	...	...	...	...	...	...
Private Pima County General Hospital, Tucson..	128	40	...	40	...	...	...	...	...	...	...	...	...	...	...	...	...
St. Mary's Hospital and Sanatorium, Tucson	135	30	...	30	...	...	...	...	...	...	...	...	...	...	...	...	...
ARKANSAS																	
County Pulaski County Hospital, Little Rock....	200	28	...	28	...	...	...	...	...	...	...	...	...	...	...	...	...
CALIFORNIA																	
Federal Fort Bidwell Hospital, Fort Bidwell.....	38	30	...	30	...	...	...	...	...	...	...	...	...	...	...	...	...
U. S. Naval Hospital, Mare Island.....	500	49	...	49	...	...	...	...	...	...	...	...	...	...	...	...	...
U. S. Naval Hospital, San Diego.....	1,000	81	...	81	...	...	...	...	...	...	...	...	...	...	...	...	...
Veterans Admin. Facility, San Francisco.....	478	46	...	46	...	...	...	...	...	...	...	...	...	...	...	...	...
County Riverside County Hospital, Arlington....	1,720	68	...	68	...	...	...	...	...	...	...	...	...	...	...	...	...
San Joaquin General Hospital, French Camp	350	82	25	107	...	...	...	...	...	...	...	...	...	...	...	...	...
Fresno County General Hospital, Fresno.....	575	60	...	60	...	...	...	...	...	...	...	...	...	...	...	...	...
Madera County Hospital, Los Angeles+.....	500	86	12	98	...	...	...	...	...	...	...	...	...	...	...	...	...
Merced General Hospital, Merced.....	3,154	300	...	300	...	...	...	...	...	...	...	...	...	...	...	...	...
Orange County Hospital, Orange.....	132	25	2	27	...	...	...	...	...	...	...	...	...	...	...	...	...
Sacramento County Hospital, Sacramento	250	60	...	60	...	...	...	...	...	...	...	...	...	...	...	...	...
Monterey County Hospital, Salinas.....	352	115	16	131	...	...	...	...	...	...	...	...	...	...	...	...	...
San Bernardino County Charity Hos- pital, San Bernardino	475	45	...	45	...	...	...	...	...	...	...	...	...	...	...	...	...
San Diego County General Hospital, San Diego+.....	191	38	5	43	...	...	...	...	...	...	...	...	...	...	...	...	...
Fairmont Hospital of Alameda County, San Leandro+.....	323	61	17	78	...	...	...	...	...	...	...	...	...	...	...	...	...
Community Hospital of San Mateo Coun- ty, San Mateo	663	146	41	187	...	...	...	...	...	...	...	...	...	...	...	...	...
Marin County Hospital, San Rafael.....	837	160	...	160	...	...	...	...	...	...	...	...	...	...	...	...	...
Santa Barbara General Hospital, Santa Barbara	200	46	...	46	...	...	...	...	...	...	...	...	...	...	...	...	...
Sonoma County Hospital, Santa Rosa.....	109	22	6	28	...	...	...	...	...	...	...	...	...	...	...	...	...
Ventura County Hospital, Ventura.....	233	56	30	86	...	...	...	...	...	...	...	...	...	...	...	...	...
City-County San Francisco Hospital, San Francisco+..	319	94	...	94	...	...	...	...	...	...	...	...	...	...	...	...	...
Private Ross General Hospital, Ross.....	240	40	2	42	...	...	...	...	...	...	...	...	...	...	...	...	...
COLORADO																	
Federal Fitzsimons General Hospital, Denver.....	1,185	500	...	500	...	...	...	...	...	...	...	...	...	...	...	...	...
City-County Denver General Hospital, Denver+.....	556	68	...	68	...	...	...	...	...	...	...	...	...	...	...	...	...
Private Beth-El General Hospital and Sana- torium, Colorado Springs.....	202	60	...	60	...	...	...	...	...	...	...	...	...	...	...	...	...
Glockner Sanatorium and Hospital, Colo- rado Springs	150	80	...	80	...	...	...	...	...	...	...	...	...	...	...	...	...
St. Francis Hospital and Sanatorium, Union Printers Home and Tuberculosis Sanatorium, Colorado Springs.....	150	75	...	75	...	...	...	...	...	...	...	...	...	...	...	...	...
City Municipal Hospitals, Hartford.....	172	60	...	60	...	...	...	...	...	...	...	...	...	...	...	...	...
CONNECTICUT																	
City Municipal Hospitals, Hartford.....	315	27	...	27	...	...	...	...	...	...	...	...	...	...	...	...	...
DISTRICT OF COLUMBIA																	
Federal St. Elizabeths Hospital	450	110	...	110	...	...	...	...	...	...	...	...	...	...	...	...	...
City Walter Reed General Hospital.....	1,042	20	6	26	...	...	...	...	...	...	...	...	...	...	...	...	...
Gallinger Municipal Hospital	1,119	191	...	191	...	...	...	...	...	...	...	...	...	...	...	...	...
FLORIDA																	
County Duval County Hospital, Jacksonville.....	216	40	...	40	...	...	...	...	...	...	...	...	...	...	...	...	...
Dade County Hospital, Miami.....	175	54	2	56	...	...	...	...	...	...	...	...	...	...	...	...	...
City James M. Jackson Memorial Hospital, Miami	400	54	...	54	...	...	...	...	...	...	...	...	...	...	...	...	...
GEORGIA																	
Federal Veterans Admin. Facility, Atlanta.....	265	25	...	25	...	...	...	...	...	...	...	...	...	...	...	...	...

1. Included in beds for children. 2. Does not include deaths. 3. Closed Dec. 15, 1939. + Approved for Residences in Tuberculosis.

4 3 Yes Yes Yes Yes

1. Included in beds for children. 2. Does not include deaths. 3. Closed Dec. 15, 1929. + Approved for Residences in Tuberculosis.

TUBERCULOSIS DEPARTMENTS OF GENERAL HOSPITALS—Continued
(TWENTY-FIVE BEDS AND OVER)

	Total Capacity	TB Beds			Preventorium Beds ¹	Admissions			Daily Average	Patients Treated	Patients Discharged ²	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics
		Adults	Children	Total		Adults	Children	Total										
IDAHO																		
Private																		
St. Alphonsus Hospital, Boise.....	135	25	...	25	..	28	2	30	23	54	28	5	21	..	Yes	Yes	Yes	..
ILLINOIS																		
Federal																		
Veterans Admin. Facility, Hines.....	1,760	263	...	263	..	...	...	...	255	250	...	...	252	..	Yes	Yes	Yes	..
County																		
Cook County Hospital, Chicago.....	3,300	340	...	340	..	1,373	...	1,373	333	1,009	596	696	326	..	Yes	Yes	Yes	..
Lake County General Hospital, Waukegan	90	25	...	25	..	57	2	59	24	77	39	14	24	6	Yes	Yes	Yes	Yes
INDIANA																		
City																		
Indianapolis City Hospital, Indianapolis.	672	100	...	100	..	162	...	162	68	203	65	63	75	..	Yes	Yes	Yes	Yes
KANSAS																		
Federal																		
Veterans Admin. Facility, Wadsworth....	734	63	...	63	..	133	...	133	58	184	80	14	60	..	Yes	Yes	Yes	..
State																		
University of Kansas Hospitals, Kansas City	300	40	5	45	..	33	...	33	30	62	21	7	34	..	Yes	Yes	Yes	Yes
LOUISIANA																		
Federal																		
Veterans Admin. Facility, Alexandria....	599	109	...	109	..	315	...	315	77	386	234	44	81	..	Yes	Yes	Yes	..
U. S. Marine Hospital, New Orleans.....	572	48	...	48	..	104	...	104	36	143	77	18	40	..	Yes	Yes	Yes	..
State																		
Charity Hospital, New Orleans.....	1,735	323	...	323	..	1,374	147	1,521	283	1,834	279	245	324	..	Yes	Yes	Yes	Yes
MAINE																		
Private																		
Central Maine General Hospital, Lewiston	193	32	...	32	..	58	...	58	32	90	55	10	32	..	Yes	Yes	Yes	Yes
MARYLAND																		
Federal																		
U. S. Marine Hospital, Baltimore.....	440	46	...	46	..	65	...	65	42	107	72	25	38	..	Yes	Yes	Yes	Yes
City																		
Baltimore City Hospitals, Baltimore+....	1,285	280	...	280	..	...	...	...	188	178	...	...	240	..	Yes	Yes	Yes	..
MASSACHUSETTS																		
Federal																		
Veterans Admin. Facility, Rutland Heights	467	273	...	273	..	...	...	...	...	...	...	...	...	..	Yes	Yes	Yes	..
State																		
State Infirmary, Tewksbury	3,150	280	...	280	..	171	...	171	...	333	180	61	153	..	Yes	Yes	Yes	..
City																		
Fall River General Hospital, Fall River...	216	93	7	100	..	103	8	111	92	207	63	40	92	2	Yes	Yes	Yes	Yes
Private																		
Burbank Hospital, Fitchburg	203	34	...	34	..	38	...	38	21	57	25	7	25	..	Yes	Yes	Yes	Yes
MICHIGAN																		
Federal ³																		
U. S. Marine Hospital, Detroit.....	291	50	...	50	..	123	...	123	44	163	63	18	42	..	Yes	Yes	Yes	Yes
State																		
University Hospital, Ann Arbor+.....	1,285	98	...	98	..	552	...	552	...	643	335	28	97	20	Yes	Yes	Yes	Yes
County																		
Eloise Hospital, Eloise	1,437	92	...	92	..	56	...	56	90	148	43	15	90	..	Yes	Yes	Yes	Yes
Grand View Hospital, Ironwood.....	62	50	...	50	..	39	1	40	42	82	51	21	31	..	Yes	Yes	Yes	Yes
Private																		
Henry Ford Hospital, Detroit.....	572	33	28	61	..	70	60	130	62	173	118	24	47	..	Yes	Yes	Yes	Yes
Lincoln Hospital, Detroit	80	50	...	50	..	139	...	139	...	164	63	59	33	..	Yes	Yes	Yes	..
Shurly Hospital, Detroit	85	25	...	25	..	50	...	50	25	81	...	21	21	..	Yes	Yes	Yes	..
MINNESOTA																		
Federal																		
Veterans Admin. Facility, Minneapolis....	642	186	...	186	..	270	...	270	171	435	310	51	163	..	Yes	Yes	Yes	Yes
City-County																		
Ancker Hospital, St. Paul.....	850	220	10	230	..	222	14	236	183	425	164	60	194	..	Yes	Yes	Yes	Yes
Private																		
St. Luke's Hospital, Duluth.....	237	26	...	26	..	76	...	76	24	102	77	7	26	8	Yes	Yes	Yes	Yes
St. Mary's Hospital, Duluth.....	260	48	...	48	..	...	...	103	36	132	138	14	51	..	Yes	Yes	Yes	..
MISSOURI																		
Federal																		
Veterans Admin. Facility, Excelsior Springs	252	31	...	31	..	71	...	71	21	91	55	13	13	..	Yes	Yes	Yes	..
City																		
Homer G. Phillips Hospital for Colored, St. Louis+	684	60	4	64	..	197	8	225	60	278	126	106	64	59	Yes	Yes	Yes	..
St. Louis City Hospital, St. Louis.....	750	70	...	70	..	...	...	...	46	50	...	124	45	..	Yes	Yes	Yes	Yes
NEBRASKA																		
Federal																		
Veterans Admin. Facility, Lincoln.....	201	25	...	25	..	24	...	24	22	48	24	5	23	..	Yes	Yes	Yes	Yes
County																		
Douglas County Hospital, Omaha.....	412	81	...	81	..	55	...	55	71	132	45	20	59	20	Yes	Yes	Yes	Yes
NEW JERSEY																		
City																		
Jersey City Hospital, Jersey City.....	1,200	60	4	64	..	219	8	227	64	294	181	20	67	..	Yes	Yes	Yes	..
Newark City Hospital, Newark.....	700	23	...	23	..	327	...	327	23	343	155	74	22	..	Yes	Yes	Yes	..
Private																		
St. Mary Hospital, Hoboken.....	400	40	...	40	..	128	...	128	24	160	76	26	32	..	Yes	Yes	Yes	..
Christ Hospital, Jersey City.....	206	25	...	25	..	41	...	41	25	66	66	41	...	..	Yes	Yes	Yes	..
St. Francis' Hospital, Jersey City.....	228	26	...	26	..	85	...	85	25	109	32	29	24	..	Yes	Yes	...	..
NEW MEXICO																		
Federal																		
Veterans Admin. Facility, Albuquerque...	259	105	...	105	..	170	...	170	91	267	139	26	102	..	Yes	Yes	Yes	Yes
Veterans Admin. Facility, Fort Bayard...	305	143	...	143	..	257	...	257	99	279	148	23	93	..	Yes	Yes	Yes	Yes
Private																		
St. Joseph Sanatorium and Hospital, Albuquerque	170	50	...	50	..	...	...	...	45	45	...	...	24	..	Yes	Yes	Yes	..
Southwestern Presbyterian Sanatorium, Albuquerque	144	87	...	87	..	111	...	111	43	159	119	14	40	..	Yes	Yes	Yes	..

1. Included in beds for children. 2. Does not include deaths. 3. Veterans Administration Facility, Dearborn. Total beds 231; beds for tuberculosis 15; opened April 15, 1932. + Approved for Residences in Tuberculosis.

TUBERCULOSIS INSTITUTIONS DEPARTMENTS OF GENERAL HOSPITALS—Continued (TWENTY-FIVE BEDS AND OVER)

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HOSPITALS—Continued																	
	Total Capacity	TB Beds		Total Preventorium Beds	Admissions		Total	Daily Average	Patients Treated	Patients Discharged	Deaths	Present Census	Waiting List	Laboratory	X-Ray	Pneumothorax	Tuberculosis Clinics
		Adults	Children		Adults	Children											
NEW YORK																	
Federal																	
U. S. Marine Hospital, New York City....	452	117	...	117	...	...	142	...	...	...	...	...	...	...	...	...	...
Veterans Admin. Facility, New York City	973	61	...	61	...	...	255	...	...	...	...	...	...	...	...	...	...
County																	
Grasslands Hospital, Valhalla+.....	780	252	92	344	16	...	226	160	386	324	696	328	57	311	..	Yes	Yes
City																	
Kings County Hospital, Brooklyn+.....	2,825	200	...	200	...	...	218	...	501	202	710	416	90	204	110	Yes	Yes
Queens General Hospital, Jamaica.....	644	32	...	32	...	...	252	36	242	184	...	328	...	31	..	Yes	Yes
Bellevue Hospital, New York City+.....	2,431	284	...	284	...	...	252	39	662	337	2,742	539	115	340	..	Yes	Yes
Harlem Hospital, New York City+.....	543	28	...	28	...	...	620	...	683	...	...	435	183	29	29	Yes	Yes
Metropolitan Hospital, New York City+...	1,367	270	37	307	...	...	538	82	620	405	1,020	539	115	352	38	Yes	Yes
New York City Hospital, New York City+...	1,000	52	...	52	...	...	258	...	258	44	294	266	76	45	..	Yes	Yes
Riker's Island Hospital, New York City..	260	52	...	52	...	...	114	...	114	18	124	95	4	21	..	Yes	Yes
City-County																	
Edward J. Meyer Memorial Hospital, Buffalo+	1,025	256	52	308	..	...	403	14	417	245	635	249	167	247	..	Yes	Yes
Private																	
Albany Hospital, Albany+.....	593	123	...	123	..	...	9	253	124	384	221	40	123	11	Yes	Yes	Yes
Metropolitan Life Insurance Company	350	225	...	225	..	...	183	...	183	37	165	42	2	..	..	Yes	Yes
Sanatorium, Mt. McGregor	541	39	...	39	..	...	263	...	263	167	432	186	79	167	73	Yes	Yes
Lenox Hill Hospital, New York City+...	714	164	...	164	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
Montefiore Hospital for Chronic Diseases, New York City+.....	251	25	...	25	..	...	25	...	25	..	..	..	..	..	..	Yes	Yes
City Hospital, Cleveland+.....	1,521	350	...	350	..	...	870	7	886	...	1,233	745	196	348	..	Yes	Yes
Private																	
Evangelical Deaconess Hospital, Cleveland	144	32	...	32	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
St. Alexis Hospital, Cleveland	220	33	...	33	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
St. Vincent Charity Hospital, Cleveland..	295	28	...	28	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
Woman's Hospital, Cleveland	93	25	...	25	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
OKLAHOMA																	
Federal																	
U. S. Marine Hospital, Lawton.....	166	29	...	29	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
Veterans Admin. Facility, Muskogee.....	423	55	...	55	..	...	..	...	..	..	..	..	..	..	..	Yes	Yes
State																	
Soldiers Tubercular Sanatorium, Sulphur.	183	56	28	84	28	...	120	3	123	31	13	29	32	..	..	Yes	Yes
PENNSYLVANIA																	
Federal																	
Veterans Admin. Facility, Aspinwall.....	505	101	...	101	..	...	110	51	161	62	183	140	20	84	..	Yes	Yes
City																	
Philadelphia General Hospital, Philadelphia	2,676	472	...	472	..	1,387	...	1,387	348	1,096	774	507	311	..	Yes	Yes	Yes
Pittsburgh City Home and Hospitals, Mayview	988	60	...	60	..	...	81	...	81	53	122	24	40	59	..	Yes	Yes
Private																	
Germantown Dispensary and Hospital, Philadelphia+	340	35	...	35	..	...	56	1	57	30	90	16	7	31	..	Yes	Yes
Jefferson Medical College Hospital, Philadelphia	688	40	...	40	..	...	83	...	83	31	120	83	5	32	6	Yes	Yes
County																	
Spartanburg General Hospital, Spartanburg	230	58	...	58	..	...	51	...	51	34	87	52	2	32	12	Yes	Yes
SOUTH DAKOTA																	
Federal																	
Veterans Admin. Facility, Hot Springs...	251	32	...	32	..	...	27	...	27	20	45	16	7	19	..	Yes	Yes
TEXAS																	
Federal																	
William Beaumont General Hospital, El Paso	602	60	...	60	..	...	105	...	105	21	122	81	11	25	..	Yes	Yes
U. S. Marine Hospital, Galveston.....	206	20	...	20	..	...	54	...	54	...	...	54	43	7	..	Yes	Yes
Veterans Admin. Facility, Legion	402	275	...	275	..	...	418	...	418	250	672	326	61	221	40	Yes	Yes
City-County																	
El Paso City-County Hospital, El Paso..	212	45	...	45	..	...	104	1	105	26	109	128	48	23	..	Yes	Yes
County																	
Salt Lake County General Hospital, Salt Lake City	231	32	...	32	..	...	43	...	43	23	73	30	16	26	..	Yes	Yes
VIRGINIA																	
Federal																	
U. S. Marine Hospital, Norfolk.....	360	40	...	40	..	...	50	...	50	10	66	33	11	22	..	Yes	Yes
WASHINGTON																	
Federal																	
U. S. Marine Hospital, Seattle.....	400	60	...	60	..	...	61	...	61	56	113	40	16	57	..	Yes	Yes
Tacoma Hospital, Tacoma	268	127	...	127	..	...	204	...	204	234	435	262	38	165	24	Yes	Yes
Veterans Admin. Facility, Walla Walla...	400	127	...	127	..	...	204	...	204	234	435	262	38	165	24	Yes	Yes
WISCONSIN																	
Federal																	
Veterans Admin. Facility, Milwaukee.....	1,178	204	...	204	..	...	445	...	445	160	572	339	63	170	6	Yes	Yes
State																	
Madison	650	25	...	25	..	...	180	2	182	24	201	150	11	24	13	Yes	Yes
Totals.....	78,505	12,603	732	13,425	61	25,378	1,011	27,677	9,405	37,978	18,895	6,291	10,192	767	127	120	79
1. Included in beds for children. 2. Does not include deaths. + Approved for Residences in Tuberculosis.																	

1. Included in beds for children. 2. Does not include deaths. + Approved for Residences in Tuberculosis.

TUBERCULOSIS DEPARTMENTS OF GENERAL HOSPITALS

(BELOW TWENTY-FIVE BEDS)

		Total Capacity of Hospital	Tuberculosis Department					Total Capacity of Hospital	Tuberculosis Department			
			Beds	Patients Admitted	Patients Present				Beds	Patients Admitted	Patients Present	
FEDERAL ALABAMA												
U. S. Marine Hospital, Mobile.....		191	12	28	6	Private		Coeur D'Alene Hospital, Coeur D'Alene.....	30	20	20	
Veterans Admin. Facility, Tuskegee.....		1,498	10	43	10			Graham Hospital, Sandpoint	21	..	1	
Private												
Atmore General Hospital, Atmore.....		25	..	2	..			ILLINOIS				
Fraternal Hospital, Montgomery.....		45	4	6	..			U. S. Marine Hospital, Chicago.....		301	17	10
John Albion Andrew Memorial Hospital		80	5	..	..			Private			
Tuskegee Institute						Amboy Public Hospital, Amboy.....				17	..	5
FEDERAL ARIZONA												
Western Navajo Hospital, Tuba City.....		32	..	32	..			Berwyn Hospital, Berwyn	75	..	..
Truxton Canon Indian Hospital, Valentine....		11	..	..	..			Evangelical Hospital, Chicago	175	..	15
Ft. Yuma Indian Hospital, Yuma.....		29	4	2	1			Provident Hospital, Chicago.....	142	3	20	
County		45	9	20	9			University of Chicago Clinics, Chicago+.....	520	13	..	
Cochise County Hospital, Douglas.....						Evanston Community Hospital, Evanston....				27	1	5
Pinal County Hospital, Florence.....		50	8	..	..			ston	27	1	6
Gila County Hospital, Globe.....		50	10	10	..			St. Elizabeth Hospital, Granite City.....	125	7	12	
Yavapai County Hospital, Prescott.....		70	..	10	..			Our Saviour's Hospital, Jacksonville.....	81	..	6	
Private												
Booker T. Washington Memorial Hospital,		30	17	54	..			St. Joseph's Hospital, Joliet	220	..	35	
Phoenix						St. Francis Hospital, Kewanee.....				67	6	81
Good Samaritan Hospital, Phoenix.....		158	..	96	..			St. Anthony's Hospital, Rock Island.....	200	4	17	
St. Joseph's Hospital, Phoenix.....		188	..	105	..			INDIANA				
Mercy Hospital, Prescott		30	..	9	..			U. S. Marine Hospital, Evansville.....		100	5	6
Desert Sanatorium and Institute of Research,		89	16	16	1			Private				
Tucson						St. John Hospital, Gary.....				17	3	6
ARKANSAS												
City		176	..	..	..			St. Joseph Hospital, Mishawaka	100	..	1
Little Rock City Hospital, Little Rock.....						Ball Memorial Hospital, Muncie				217
CALIFORNIA												
Hoopa Valley Indian Hospital, Hoopa.....		38	8	19	3			St. Anthony's Hospital, Terre Haute.....	171	..	30	
Station Hospital, March Field.....		70	..	..	..			IOWA			
Soboba Indian Hospital, San Jacinto.....		34	12	14	8			Veterans Admin. Facility, Des Moines.....		300	..	63
U. S. Ship Relief, San Pedro.....		367	..	..	..			Private			
County		115	20	32	..			Mercy Hospital, Burlington	125	..	10	
Imperial County Farm and Hospital, El Central						St. Francis Hospital, Burlington				50
San Benito County Hospital, Hollister.....		11	9	8	3			St. Anthony Hospital, Carroll	108	..	6	
Stanislaus County Hospital, Modesto.....		230	15	28	23			Mercy Hospital, Cedar Rapids.....	147	..	..
Shasta County Hospital, Redding.....		77	12	10	4			St. Joseph Mercy Hospital, Centerville.....	53	3	9	
Santa Cruz County Hospital, Santa Cruz.....		110	20	34	19			St. Francis Hospital, Grinnell	40	7	4	
Private												
Banning Hospital and Sanatorium, Banning..		25	15	13	11			St. Joseph Mercy Hospital, Waverly	50	..	6	
Long Beach Community Hospital, Long Beach		100	..	7	..			KANSAS				
Seaside Memorial Hospital, Long Beach.....		200			Station Hospital, Ft. Riley		201	..	6
California Hospital, Los Angeles.....		261	..	35	..			Haskell Institute Hospital, Lawrence.....	40	..	..
St. Bernardine's Hospital, San Bernardino....		125	..	5	..			Private				
Santa Barbara Cottage Hospital, Santa Bar-		165	..	22	1			Halstead Hospital, Halstead	150	..	21	
bara						Bethany Hospital, Kansas City				130	..	13
COLORADO												
State		160	..	31	1			St. Margaret's Hospital, Kansas City	224	..	31	
Colorado General Hospital, Denver.....						St. John's Hospital, Leavenworth				65	2	5
Private												
St. Joseph's Hospital, Denver.....		240	..	..	..			Grisell Memorial Hospital, Ransom	24	..	..
Mennonite Hospital and Sanitarium, La Junta		70	20	21	10			KENTUCKY				
St. Mary Hospital, Pueblo.....		159	8	43	4			Station Hospital, Ft. Knox		47	..	6
Mt. San Rafael Hospital, Trinidad.....		63	10	..	..			City	..	140	..
CONNECTICUT												
Charlotte Hungerford Hospital, Torrington...		130	..	12	..			Louisville City Hospital, Louisville	528	..	..
DELAWARE												
Kent General Hospital, Dover.....		50	..	..	..			Private	9	3	7
DISTRICT OF COLUMBIA												
Freedman's Hospital, Washington.....		322	..	83	1			Red Bird Evangelical Hospital, Beverly.....	326	12	31	
U. S. Naval Hospital, Washington.....		202	..	..	1			St. Elizabeth Hospital, Covington.....	91	7	19
Veterans Admin. Facility, Washington.....		327	..	281	14			Wm. Booth Memorial Hospital, Covington....	51	..	51	
Private												
Garfield Memorial Hospital, Washington.....		316	11	..	..			T. J. Samson Community Hospital, Glasgow..	51	..	..
Providence Hospital, Washington.....		260	..	..	..			Mayfield Hospital, Mayfield	40	2	27
Washington Sanitarium and Hospital, Wash-		170	..	5	..			LOUISIANA				
ington						Private				Flint Goodridge Hospital, New Orleans.....	68	1	17
FLORIDA												
Veterans Admin. Facility, Bay Pines.....		195	4	..	..			St. Landry Clinic, Opelousas	25	..	..
U. S. Marine Hospital, Key West.....		65	10	7	2			North Louisiana Sanitarium, Shreveport	100	1	21	
State												
Florida Agricultural and Mechanical Hospital		43	3	14	..			Gilmer Chest Hospital, Shreveport.....	18	15	..	
Tallahassee						MAINE						
City		30	2	7	..			U. S. Marine Hospital, Portland.....		72	..	6
Brevard Hospital, Melbourne						Veterans Admin. Facility, Togus.....				291	4	49	4
Mercy Hospital, St. Petersburg.....		44	..	7	..			Private				
Mound Park Hospital, St. Petersburg.....		172	..	9	..			Rumford Community Hospital, Rumford....	75	1	8	
Private												
Orange General Hospital, Orlando.....		125	15	..	..			MARYLAND			
Panama City Hospital, Panama City.....		16	2	1	..			Station Hospital, Edgewood		56	..	2
Centro Asturiano Hospital, Tampa.....		75	12	6	11			Private	175	..	15	
GEORGIA												
Station Hospital, Fort Benning.....		315	..	10	1			Bon Secours Hospital, Baltimore.....	175	..	13	
City		227	23	115	..			Franklin Square Hospital, Baltimore.....	175	..	..
University Hospital, Augusta						MASSACHUSETTS						
Private		25	..	4	4			U. S. Marine Hospital, Chelsea.....		170	12	25
Coker's Hospital, Canton						Private				Beth Israel Hospital, Boston.....	220	2
IDAHO												
Coeur D'Alene Hospital, Coeur D'Alene.....		30	20	20	12			Truesdale Hospital, Fall River.....	131	..	15	
Graham Hospital, Sandpoint		21	..	..	1			Union Hospital, Fall River	172	..	19
ILLINOIS												
U. S. Marine Hospital, Chicago.....		301	17	10	7			Newton Hospital, Newton	252	..	7	
Private												
Amboy Public Hospital, Amboy.....		17	..	5	..			Waltham Hospital, Waltham	215	..	..
INDIANA												
U. S. Marine Hospital, Evansville.....		100	5	6	2			MICHIGAN				
Private												
St. John Hospital, Gary.....		17	3	6	6			Hurley Hospital, Flint		417	10	..
St. Joseph Hospital, Mishawaka		100	..	1	..			Private	320	..	..
Ball Memorial Hospital, Muncie		217	..	..	..			St. Mary's Hospital, Detroit	26	19	22
St. Anthony's Hospital, Terre Haute.....		171	..	30	..			West Fort Hospital, Detroit	26	..	4	
IOWA												
Veterans Admin. Facility, Des Moines.....		300	..	63	7			Woman's Hospital, Detroit	225	..	27	
Private												
Mercy Hospital, Burlington		125	..	10	..			St. Luke's Hospital, Marquette.....	125	..	..
St. Francis Hospital, Burlington		50	..	..	..			Munising Hospital, Munising	24	1	..
St. Anthony Hospital, Carroll		108	..	6	..			MINNESOTA				
Mercy Hospital, Cedar Rapids.....		147			Fond du Lac Indian Hospital, Cloquet.....		21	..	3
St. Joseph Mercy Hospital, Centerville.....		53	3	9	1							
St. Francis Hospital, Grinnell		40	7	4	1							
St. Joseph Mercy Hospital, Waverly		50	..	6	..							
KANSAS												
Station Hospital, Ft. Riley		201	..	6	..							
Haskell Institute Hospital, Lawrence.....		40	..	..	..				
KENTUCKY												
Station Hospital, Ft. Knox		47	..	6	..							
City		..	140	..	..					
Louisville City Hospital, Louisville		528	..	..	..				
LOUISIANA												
Private		9	3	7	..							
Red Bird Evangelical Hospital, Beverly.....		326	12	31	19							
St. Elizabeth Hospital, Covington.....		91	7	19	7							
Wm. Booth Memorial Hospital, Covington....		51	..	51	..							
T. J. Samson Community Hospital, Glasgow..		51	..	..	..				
Mayfield Hospital, Mayfield		40	2	27	..							

+ Approved for Residences in Tuberculosis.

TUBERCULOSIS DEPARTMENTS OF GENERAL HOSPITALS—Continued
(BELOW TWENTY-FIVE BEDS)

					Tuberculosis Department			
					Total Capacity of Hospital	Beds	Patients Admitted	Patients Present
MINNESOTA—Continued								
State								
University Hospitals, Minneapolis	450	10	52	8				
City								
Minneapolis General Hospital, Minneapolis....	616	10	124	10				
Miller Memorial Hospital, Duluth	50	21	27	..				
Private								
Asbury Hospital, Minneapolis	122	..	10	..				
St. Mary's Hospital, Minneapolis	230	12	56	7				
Swedish Hospital, Minneapolis	225	..	11	..				
St. Joseph's Hospital, St. Paul.....	250	..	..	..	
MISSISSIPPI								
Federal								
Choctaw-Mississippi Hospital, Philadelphia....	35	..	4	..				
Mississippi State Charity Hospital, Jackson..	72	..	25	..				
City								
Rosedale-Bolivar County Hospital, Rosedale..	18	..	3	..				
Private								
Biloxi Hospital, Biloxi	58	..	1	..				
Northeast Mississippi Hospital, Booneville....	40	8	18	..				
Colored King's Daughter's Hospital, Greenville	50	..	4	..				
King's Daughters Hospital, Gulfport	57	..	1	..				
Houston Hospital, Houston	35	..	7	..				
Jackson Infirmary, Jackson	67	..	4	..				
Mississippi Baptist Hospital, Jackson	138	..	17	..				
McComb City Hospital, McComb	27	..	1	..				
Anderson Infirmary, Meridian	45	..	1	..				
Philadelphia Hospital, Philadelphia	28	..	1	..				
Martin Sanatorium, Piquette	24	..	1	..				
Vicksburg Infirmary, Vicksburg	50	..	6	..				
Vicksburg Sanatorium, Vicksburg	75	..	16	..				
Winona Infirmary, Winona	30	..	4	..				
MISSOURI								
Federal								
Station Hospital, Jefferson Barracks	143	..	5	..				
U. S. Marine Hospital, St. Louis.....	120	10	7	11				
City								
Kansas City General Hospital, Kansas City...	400	6	..	..		
Kansas City General Hospital, No.2, Kansas City	250	19	93	7				
Private								
Independence Sanitarium and Hospital, Inde-	67	..	8	..				
pendence .....	..	..	..	..
De Paul Hospital, St. Louis.....	250	..	8	..				
Jewish Hospital, St. Louis	250	..	21	..				
Lutheran Hospital,	150	..	8	..				
St. John's Hospital,	286	..	15	..				
MONTANA								
Federal								
Blackfeet Hospital, Browning	45	6	41	2				
Pt. Belknap Indian Hospital, Harlem.....	49	11	31	7				
Tongue River Agency Hospital, Lame Deer...	42	..	..	7				
County								
Silver Bow County Hospital, Butte.....	129	15	45	17				
Private								
St. James Hospital, Butte	175	4	20	..				
Columbus Hospital, Great Falls	340	..	28	..				
Good Samaritan Hospital, Jordan	20	2	..	..		
St. Joseph's Hospital, Lewiston	133	5	7	..				
NEBRASKA								
Federal								
Winnebago Indian Hospital, Winnebago	63	17	48	6				
City								
Lincoln General Hospital, Lincoln	154	3	17	2				
Private								
St. Joseph's Hospital, Alliance	80	..	..	6				
St. Elizabeth Hospital, Lincoln	174	..	19	..				
NEVADA								
Federal								
Walker River Indian Hospital, Schurz.....	34	..	11	..				
Carson Agency Hospital, Stewart.....	36	..	27	6				
County								
Lyon County Hospital, Yerington	16	4	..	..		
Washoe General Hospital, Reno	190	10	..	..		
NEW HAMPSHIRE								
Private								
Mary Hitchcock Memorial Hospital, Hanover	154	..	..	..	
NEW JERSEY								
City								
Irrington General Hospital, Irvington.....	96	..	11	..				
Private								
Atlantic City Hospital, Atlantic City.....	231	..	..	..	
Bayonne Hospital and Dispensary, Bayonne...	195	..	39	4				
Dr. E. C. Hazard Hospital, Long Branch.....	95	9	10	3				
Burlington County Hospital, Mt. Holly.....	123	..	12	2				
St. Francis Hospital, Trenton	222	..	27	..				
NEW MEXICO								
Federal								
Eastern Navajo Hospital, Crownpoint.....	40	..	155	..				
Zuni Sanatorium, Black Rock	43	10	19	5				
Private								
St. Joseph's Hospital, Clayton.....	25	3	3	..				
San Juan Hospital, Farmington.....	20	4	..	..		
St. Vincent Sanatorium and Hospital, Santa Fe	100	..	1	1				
NEW YORK								
Federal								
U. S. Naval Hospital, Brooklyn	508	..	11	1				
U. S. Marine Hospital, Buffalo.....	75	3	9	1				
Station Hospital, Fishers Island.....	66	3	3	..				
Station Hospital, Ft. Slocum.....	145	..	20	1				
NEW YORK—Continued								
County								
Onondago County Hospital, Onondago.....	183	6	12	4				
Oneida County Hospital, Rome.....	200	..	18	..				
City								
Coney Island Hospital, Brooklyn.....	357	..	67	..				
Gouverneur Hospital, New York.....	174	..	213	221				
Morrisania City Hospital, New York.....	471	..	106	18				
Private								
Long Island College Hospital, Brooklyn.....	420	..	76	..				
St. John's Hospital, Brooklyn.....	204	7	23	8				
Arnot Ogden Memorial Hospital, Elmira.....	183	..	23	..				
Charles S. Wilson Memorial Hospital, Johnson	318	15	29	4				
City.....	121	..	11	..				
New	85	..	8	1				
Com	226	17	77	1				
Man	911	19	136	19				
New .....	..	..	..	..
New York Post-Graduate Medical School and	410	2	..	..		
Hospital, New York	67	2	..	..		
University Heights Sanitarium, New York.....	77	14	13	13				
Peekskill Hospital, Peekskill	34	14	304	3				
General Hospital, Saranac Lake.....	194	4	..	..		
Sailors' Snug Harbor Hospital, Staten Island.	210	..	34	..				
Syracuse Memorial Hospital, Syracuse.....	..	..	..	..
NORTH CAROLINA								
Federal								
Station Hospital, Ft. Bragg.....	115	..	5	..				
State								
Central Prison Hospital, Raleigh.....	110	9	..	..		
Private								
Duke Hospital, Durham	400	..	..	..	
L. Richardson Memorial Hospital, Greensboro	60	3	..	..		
Ellen Fitzgerald Hospital, Monroe.....	35	..	4	..				
NORTH DAKOTA								
Federal								
Fort Berthold Indian Hospital, Elbowoods....	25	2	8	1				
Veterans Admin. Facility, Fargo.....	100	..	12	..				
Ft. Totten Hospital, Ft. Totten.....	37	..	23	..				
County								
Cass County Hospital, Fargo.....	30	8	6	..				
Private								
Trinity Hospital, Jamestown	77	..	5	..				
St. Joseph's Hospital, Minot.....	110	2	..	..		
Mercy Hospital, Valley City.....	87	7	..	..		
OHIO								
City								
Springfield City Hospital, Springfield.....	258	11	..	..		
Private								
Bethesda Hospital, Cincinnati.....	239	..	18	..				
Good Samaritan Hospital, Cincinnati.....	550	10	73	10				
Fairview Park Hospital, Cleveland.....	109	8	4	8				
Polyclinic Hospital,	105	..	68	..				
Good Samaritan	250	22	123	20				
Miami Valley Ho.....	385	..	105	19				
St. Elizabeth Hospital, Dayton.....	400	20	42	19				
Salem City Hospital, Salem	60	15	19	15				
Mercy	115	..	..	2				
Toledo	275	8	30	3				
Young	503	7	63	7				
OKLAHOMA								
Federal								
Clinton Indian Hospital, Clinton.....	33	..	28	1				
Cheyenne and Arapaho Hospital, Concho....	40	14	13	..				
Pawnee Ponca Hospital, Pawnee.....	50	16	60	4				
Private								
St. Anthony Hospital, Oklahoma City.....	300	..	18	..				
Great Western Hospital, Oklahoma City.....	35	15	47	6				
Ponca City Hospital, Ponca City.....	50	3	12	..				
OREGON								
Federal								
Klamath Indian Hospital, Klamath Agency...	27	3	..	..		
PENNSYLVANIA								
State								
Scranton State Hospital, Scranton.....	125	..	18	..				
Private								
Fitzgerald Mercy Hospital, Darby.....	200	12	20	..				
Easton Hospital, Easton	200	5	..	..		
Frankford Hospital, Philadelphia	144	..	15	..				
Frederick Douglas Memorial Hospital, Phila-	55	21	62	19				
delphia .....	..	..	..	..
Hospital of the Protestant Episcopal Church,	530	6	44	9				
Philadelphia	100	4	57	2				
Mercy Hospital,	58	..	25	..				
.. ..	356	4	..	4				
.. ..	195	3	..	..		
SOUTH CAROLINA								
Federal								
Station Hospital, Moultrieville	90	6	23	..				
Private								
Berkeley County Hospital, Monck Corners....	62	22	19	13				
SOUTH DAKOTA								
Federal								
Rosebud Agency Indian Hospital, Rosebud...	61	..	41	3				
Private								
Methodist State Hospital, Mitchell.....	100	..	..	60				
Moie Hospital and Clinic, Sioux Falls.....	66	6	12	..				
Sacred Heart Hospital, Yankton	195	..	14	..				

TUBERCULOSIS DEPARTMENTS OF GENERAL HOSPITALS—Continued
(BELOW TWENTY-FIVE BEDS)

	Total Capacity of Hospital	Tuberculosis Department				Total Capacity of Hospital	Tuberculosis Department		
		Beds	Patients Admitted	Patients Present			Beds	Patients Admitted	Patients Present
TENNESSEE									
Federal									
U. S. Marine Hospital, Memphis.....	130	9	..	9					
Veterans Admin. Facility, Memphis.....	450	..	74	..					
Veterans Admin. Facility, Mountain Home....	556	8	72	..					
Private									
Clarksville Hospital, Clarksville	50	..	6	..					
Fitts-White Clinic, Jackson	20	2	13	..					
Methodist Hospital, Memphis	155	..	..	..		
George W. Hubbard Hospital, Nashville.....	163	8	61	9					
"Uplands" Cumberland Mountain Sanatorium, Pleasant Hill	44	24	37	14					
Pulaski Hospital, Pulaski	23	..	1	..					
TEXAS									
Federal									
Station Hospital, San Antonio.....	670	20	40	10					
State									
Texas State Prison Hospital, Huntsville.....	108	10	..	..			
Prairie View Hospital, Prairie View.....	50	4	3	2					
County									
Northwest Texas Hospital, Amarillo.....	75	11	11	11					
City									
John Sealy Hospital, Galveston.....	434	16	..	..			
Private									
Methodist Hospital, Dallas	140	..	8	..					
Fort Worth Negro Community Hospital, Ft. Worth	25	7	20	..					
Lillie and Duke Hospital, Goose Creek.....	21	..	2	..					
Medical and Surgical Memorial Hospital, San Antonio	100	..	12	..					
Hillcrest Memorial Hospital, Waco.....	75	..	12	..					
St. Joseph's Hospital, Wellington.....	20	..	..	..		
UTAH									
Federal									
Uintah and Ourah Agency Hospital, Ft. Duchesne	28	..	..	..		
Private									
Holy Cross Hospital, Salt Lake City.....	200	..	10	..					
St. Mark's Hospital, Salt Lake City.....	150	16	9	14					
VERMONT									
Private									
Mary Fletcher Hospital, Burlington.....	135	..	..	..		
VIRGINIA									
Federal									
Station Hospital, Ft. Myer.....	82	..	8	..					
Veterans Admin. Facility, Kecoughton.....	80	..	26	1					
VIRGINIA—Continued									
Station Hospital, Langley Field.....	63	..	3	..					
Norfolk Naval Hospital, Portsmouth.....	418	18	56	12					
State									
University of Virginia Hospital, Charlottesville	338	14	..	..			
Private									
Rockingham Memorial Hospital, Harrisonburg	120	..	20	..					
WASHINGTON									
Federal									
U. S. Naval Hospital, Bremerton.....	263	4	10	9					
Station Hospital, Ft. Lewis.....	167	2	..	..			
Colville Hospital, Nespelem	40	4	15	7					
Station Hospital, Vancouver	118	..	..	..		
County									
Pierce County Hospital, Tacoma.....	198	8	26	..					
Private									
Columbus Hospital, Seattle	200	4	26	1					
Memorial Hospital, Sedro Wooley.....	30	2	..	..			
South Bend General Hospital, South Bend.....	21	3	3	..					
Deaconess Hospital, Spokane	185	..	8	..					
WEST VIRGINIA									
Federal									
Veterans Admin. Facility, Huntington.....	210	7	85	7					
Private									
Charleston General Hospital, Charleston.....	255	..	61	..					
Laird Memorial Hospital, Montgomery.....	127	..	6	..					
Wheeling Hospital Wheeling	240	10	16	..					
WISCONSIN									
Federal									
Hayward Indian Hospital, Hayward.....	55	15	76	8					
Tomah Indian Hospital, Tomah.....	42	12	30	1					
County									
Milwaukee County Hospital, Wauwatosa.....	1,030	..	174	..					
Private									
Luther Hospital, Eau Claire.....	155	3	10	..					
Kenosha Hospital, Kenosha	180	..	3	..					
Grandview Hospital, La Crosse.....	106	..	12	..					
St. Francis Hospital, La Crosse.....	230	5	29	..					
Columbia Hospital, Milwaukee	150	..	7	..					
Misericordia Hospital, Milwaukee	110	..	7	..					
St. Mary's Hospital, Wausau.....	130	..	22	..					
WYOMING									
Federal									
Wind River Indian Hospital, Ft. Washakie....	44	5	11	4					
Veterans Admin. Facility, Cheyenne.....	105	..	8	..					
Private									
Wheatland General Hospital, Wheatland.....	48	..	2	..					

TUBERCULOSIS DEPARTMENTS OF MENTAL HOSPITALS

	Total Capacity of Hospital	Tuberculosis Department				Total Capacity of Hospital	Tuberculosis Department		
		Beds	Patients Admitted	Patients Present			Beds	Patients Admitted	Patients Present
ARKANSAS									
Federal									
Veterans Admin. Facility, North Little Rock..	1,347	28	12	28	State				
State					Western State Hospital, Hopkinsville.....	1,920	151	..	118
State Hospital, Benton Division, Haskell.....	1,750	50	..	..	Central State Hospital, Lakeland.....	2,469	74	..	..
CALIFORNIA									
State					Eastern State Hospital, Lexington.....	1,573	20	..	..
Mendocino State Hospital, Talmage.....	2,896	..	..	..	MAINE				
CONNECTICUT									
State					State				
Connecticut State Hospital, Middletown.....	3,315	120	..	115	Bangor State Hospital, Bangor.....	1,106	43	13	30
DELAWARE									
State					Pownall State School, Pownall.....	110	..	4	11
Delaware State Hospital, Farnhurst.....	1,169	17	17	..	MARYLAND				
FLORIDA									
State					Federal				
Florida State Hospital, Chattahoochee.....	4,297	71	56	53	Veterans Admin. Facility, Perry Point.....	1,391	45	6	43
ILLINOIS									
State					State				
Veterans Admin. Facility, Danville.....	1,788	29	..	..	Crownsville State Hospital, Crownsville.....	1,455	..	..	..
State					MASSACHUSETTS				
Chicago State Hospital, Chicago.....	4,288	75	75	75	State				
East Moline State Hospital, East Moline.....	2,240	68	..	59	Boston State Hospital, Boston.....	2,500	55	..	..
Elgin State Hospital, Elgin.....	4,614	100	62	66	Danvers State Hospital, Danvers.....	2,421	48	..	..
Jacksonville State Hospital, Jacksonville.....	3,403	85	13	74	Foxboro State Hospital, Foxboro.....	1,426	54	27	21
Kankakee State Hospital, Kankakee.....	4,111	97	..	..	Northampton State Hospital, Northampton...	2,693	20	6	..
Manteno State Hospital, Manteno.....	5,233	104	..	..	Taunton State Hospital, Taunton.....	1,720	62	21	..
Illinois Security Hospital, Menard.....	475	10	..	..	MICHIGAN				
INDIANA									
Federal					Federal				
Veterans Admin. Facility, Veterans Admin- istration Hospital	1,506	80	19	71	Veterans Admin. Facility, Camp Custer.....	1,010	25	6	24
IOWA									
State					State				
Cherokee State Hospital, Cherokee.....	1,709	72	19	78	Ionla State Hospital, Ionla.....	922	53	..	..
Iowa Institute for Feeble-minded Children, Glenwood	1,534	47	47	..	Kalamazoo State Hospital, Kalamazoo.....	2,765	19	..	..
KENTUCKY									
Federal					Lapeer State Home Training School, Lapeer...	3,923	73	20	..
U. S. Public Health Service Hospital, Lexington	1,000	28	24	22	Pontiac State Hospital, Pontiac.....	1,825	73	..	..
KENTUCKY—Continued									
State					Traverse City State Hospital, Traverse City..	2,310	100	15	..
State Hospital, Benton Division, Haskell.....	1,750	50	..	..	Ypsilanti State Hospital, Ypsilanti.....	2,370	40	19	24
MAINE									
State					MINNESOTA				
Bangor State Hospital, Bangor.....	1,106	43	13	30	Federal				
Pownall State School, Pownall.....	110	..	4	11	Veterans Admin. Facility, St. Cloud.....	1,046	20	8	17
MARYLAND									
Federal					State				
Veterans Admin. Facility, Perry Point.....	1,391	45	6	43	St. Peter State Hospital, St. Peter.....	2,272	145	56	142
State									
Crownsville State Hospital, Crownsville.....	1,455	..	..	..		

TUBERCULOSIS DEPARTMENTS OF MENTAL HOSPITALS—Continued

		Total Capacity of Hospital	Tuberculosis Department					Total Capacity of Hospital	Tuberculosis Department		
			Beds	Patients Admitted	Patients Present				Beds	Patients Admitted	Patients Present
MISSISSIPPI											
State											
East Mississippi State Hospital, Meridian.....	880	40	..	36							
MISSOURI											
Federal											
Medical Center for Federal Prisoners, Spring- field	549	68	46	..							
City											
City Sanitarium, St. Louis.....	3,600	40	24	35							
NEBRASKA											
State											
Hastings State Hospital, Ingleside.....	1,668	86	..	..					
NEW JERSEY											
State											
New Jersey State Hospital, Greystone Park...	5,362	190	124	186							
New Jersey State Hospital, Marlboro	2,811	100	90	88							
New Jersey State Hospital, Trenton	2,850	240	125	233							
North Jersey Training School, Totowa.....	690	..	1	..							
County											
Essex County Hospital, Cedar Grove.....	2,506	171	18	64							
NEW YORK											
Federal											
Veterans Admin. Facility, Canandaigua.....	1,115	26	13	13							
State											
Binghamton State Hospital, Binghamton.....	2,974	104	6	90							
Pilgrim State Hospital, Brentwood.....	8,860	102	102	21							
Central Islip State Hospital, Central Islip...	7,164	236	..	109							
Clinton Prison General and Tuberculosis Hos- pital, Dannemora	133	73	32	65							
Gowanda State Homeopathic Hospital, Hel- msuth	2,228	174	21	86							
Kings Park State Hospital, Kings Park.....	5,954	396	144	354							
Middleton State Homeopathic Hospital, Mid- dleton	3,392	162	42	86							
Marcy State Hospital, Marcy.....	2,733	160	..	101							
Institution for Male Defective Delinquents, Napanoch	28	4	3	2							
St. Lawrence State Hospital, Ogdensburg....	2,226	119	8	103							
Hudson River State Hospital, Poughkeepsie...	4,465	216	79	241							
Rochester State Hospital, Rochester.....	3,384	88	24	74							
Willard State Hospital, Willard.....	3,065	88	21	88							
Harlem Valley State Hospital, Wingdale.....	4,800	141	48	124							
NORTH DAKOTA											
State											
Grafton State School, Grafton.....	1,093	4	4	..							
OHIO											
Federal											
Veterans Admin. Facility, Chillicothe.....	1,102	29	3	28							
State											
Institution for Feeble-minded, Columbus.....	2,075	20	5	..							
OHIO—Continued											
Dayton State Hospital, Dayton.....	1,741	96	..	..					
Columbus State Hospital, Columbus.....	2,639	60	43	47							
Ohio Hospital for Epileptics, Gallipolis.....	2,274	35	..	30							
Massillon State Hospital, Massillon.....	3,164	74	..	74							
PENNSYLVANIA											
Federal											
Veterans Admin. Facility, Coatesville.....	1,461	40	..	31							
State											
Allentown State Hospital, Allentown.....	1,650	95	12	92							
Danville State Hospital, Danville.....	2,082	88	..	..					
Harrisburg State Hospital, Harrisburg.....	1,921	140	..	..					
Pennhurst State School, Pennhurst.....	1,746	..	..	..				
Warren State Hospital, Warren.....	2,300	25	..	..					
County											
Blakely Home, Olyphant	157	6	..	5							
Retreat Mental Hospital, Retreat.....	1,075	40	1	46							
Allegheny County Home and Hospital for In- sane, Woodville	1,275	247	209	236							
City											
Pittsburgh City Home and Hospital, Mayview	2,652	80	30	78							
Private											
Elwyn Training School, Elwyn.....	1,075	46	..	..					
RHODE ISLAND											
State											
State Hospital for Mental Diseases, Howard..	3,000	83	22	50							
TENNESSEE											
State											
Eastern State Hospital, Knoxville.....	1,570	94	..	83							
Central State Hospital, Nashville.....	1,838	63	..	..					
TEXAS											
Federal											
Veterans Admin. Facility, Waco.....	947	8	..	..					
State											
Rusk State Hospital, Rusk.....	2,224	161	..	..					
VIRGINIA											
State											
State Colony for Epileptics and Feeble-minded, Colony	1,300	62	7	52							
Central State Hospital, Petersburg.....	3,582	96	39	71							
Western State Hospital, Staunton.....	2,438	70	15	47							
WASHINGTON											
Federal											
Veterans Admin. Facility, American Lake.....	710	8	7	6							
State											
Western State Hospital, Ft. Steilacoom.....	2,604	112	..	..					
Eastern State Hospital, Medical Lake.....	1,900	60	..	..					
WYOMING											
Federal											
Veterans Admin. Facility, Sheridan.....	579	15	7	10							

OTHER TUBERCULOSIS DEPARTMENTS

	Total Capacity of Hospital	Tuberculosis Department				Total Capacity of Hospital	Tuberculosis Department		
		Beds	Patients Admitted	Patients Present			Beds	Patients Admitted	Patients Present
ALABAMA									
State									
Kilby Prison Hospital, Montgomery.....	105	50	18	43					
ARKANSAS									
County									
Sebastian County Hospital, Ft. Smith.....	80	22	..	..			
CALIFORNIA									
Federal									
U. S. Penitentiary Hospital, Alcatraz.....	23	3	..	..			
State									
Charles L. Neumiller Memorial Hospital, San Quentin	200	55	32	49					
Private									
Sante Fe Coast Lines Hospital, Los Angeles..	150	..	..	..		
Lane Sanitarium, San Diego.....	10	8	17	5					
Southern Pacific Gen. Hospital, San Francisco	400	..	52	..					
COLORADO									
State									
Colorado State Penitentiary Hospital, Canon City	40	6	4	6					
County									
Island Grove Hospital, Greeley.....	60	..	13	1					
Private									
Temple Sanitarium, Englewood	35	20	20	20					
CONNECTICUT									
State									
Connecticut State Prison Hospital, Wether- field	50	8	4	1					
DISTRICT OF COLUMBIA									
City									
District of Columbia Reformatory Hospital, Washington	80	16	27	21					
FLORIDA									
State									
Florida State Farm Hospital, Raiford.....	95	19	30	19					
County									
Pineellas County Home, Largo.....	38	33	23	14					
GEORGIA									
Federal									
U. S. Penitentiary Hospital, Atlanta.....	187	6	23	6					
IDAHO									
State									
University of Idaho Infirmary, Moscow.....	30	..	..	..		
ILLINOIS									
State									
Illinois State Penitentiary Hospital, Menard..	38	14	26	..					
Illinois State Penitentiary Hospital, Pontiac..	40	14	18	25					
Private									
St. John's Sanitarium, Springfield.....	300	200	341	167					
INDIANA									
State									
Indiana State Reformatory Hospital, Pen- dleton	120	16	..	..			
IOWA									
State									
Iowa State College Hospital, Ames.....	75	..	..	..		
Men's Reformatory Hospital, Anamosa.....	25	..	1	..					
Iowa State Penitentiary Hospital, Ft. Madison.	35	8	..	..			
Iowa State Soldier's Home Hospital, Marshall- town	180	..	1	..					
KANSAS									
Federal									
U. S. Penitentiary Annex Hospital, Ft. Leavenworth	175	15	38	..					
U. S. Penitentiary Hospital, Leavenworth....	180	5	26	..					
KENTUCKY									
State									
State Prison Hospital, La Grange.....	65	15	23	9					
MAINE									
Private									
Restland, East Parsonfield	50	25	10	10					
MARYLAND									
State									
Maryland Penitentiary Hospital, Baltimore...	50	14	29	12					
Maryland House of Correction, Jessup.....	47	7	12	..					

OTHER TUBERCULOSIS DEPARTMENTS—Continued

	Total Capacity of Hospital	Tuberculosis Department				Total Capacity of Hospital	Tuberculosis Department		
		Beds	Patients Admitted	Patients Present			Beds	Patients Admitted	Patients Present
Private MARYLAND—Continued									
James Lawrence Kernan Hospital, Baltimore...	80	..	..	..	Private NEW YORK—Continued				
State MASSACHUSETTS									
Hospital of Norfolk State Prison Colony, Norfolk	75	27	22	18	Seaside Hospital, Staten Island.....	196	16	16	12
Private Robert Breck Brigham Hospital, Boston.....	115	..	..	..	State NORTH CAROLINA				
New England Peabody Home, Newton Center	100	..	11	67	North Carolina Orthopedic Hospital, Gastonia	100	43	75	..
Shriner's Hospital for Crippled Children, Springfield	60	..	..	2	County Durham County Infirmary, Durham.....	24	24	63	..
State MICHIGAN									
Michigan State Prison Hospital, Jackson....	200	50	17	..	State OHIO				
Central Michigan Children's Hospital, Traverse City	26	..	13	..	Ohio Penitentiary Hospital, Columbus.....	125	..	53	15
Private Children's Hospital, Detroit.....	239	..	56	..	Girls Industrial School Hospital, Delaware....	32	8	..	..
State MINNESOTA									
Minnesota State Reformatory Hospital, St. Cloud	30	16	25	16	Harmon Hospital, Marysville	34	2	..	..
Gillette State Hospital for Crippled Children, St. Paul	250	..	37	..	Federal OKLAHOMA				
State MISSOURI									
Missouri State Penitentiary Hospital, Jefferson City	230	40	..	..	U. S. Southwestern Reformatory, El Reno....	40	3	3	1
Private Missouri Odd Fellows Home and Hospital, Liberty	85	1	1	..	State OREGON				
Missouri Pacific Hospital, St. Louis.....	300	..	55	..	Oregon State Penitentiary Hospital, Salem....	32	4	..	4
Shriners' Hospital for Crippled Children, St. Louis	100	10	62	6	State PENNSYLVANIA				
State NEBRASKA									
Nebraska State Penitentiary Hospital.....	22	5	..	3	Western State Penitentiary Hospital, Bellefonte	22	2	2	..
State NEW JERSEY									
New Jersey Reformatory Hospital, Rahway...	16	2	7	2	State Hospital for Crippled Children, Elizabethtown	125	30	24	..
New Jersey State Prison Hospital, Trenton...	42	10	10	7	Eastern State Penitentiary Hospital, Philadelphia	60	18	8	13
State NEW MEXICO									
New Mexico Penitentiary Hospital, Santa Fe..	45	8	6	5	Western Penitentiary Hospital, Pittsburgh... County	30	..	..	9
Private A. T. & S. F. Hospital, Albuquerque.....	67	13	32	9	Erie County Home, Girard.....	32	22	58	..
State NEW YORK									
Clinton Prison General and Tuberculosis Hospital, Dannemora	133	73	32	65	Retreat Home for Chronic Diseases, Retreat..	500	22	8	10
					City-County Philadelphia County Prison Hospital, Philadelphia	60	6	30	..
					Private Children's Hospital, Philadelphia.....	124	6	..	..
					St. Christopher's Hospital for Children, Philadelphia	82	..	7	..
					Private UTAH				
					Primary Children's Hospital, Salt Lake City..	35	..	..	..
					State VERMONT				
					Vermont State Prison Hospital, Windsor.....	12	1	1	1
					State VIRGINIA				
					State Farm Hospital, State Farm.....	100	50	26	22
					Federal WASHINGTON				
					U. S. Penitentiary Hospital, Steilacoom.....	85	8	18	6
					State WISCONSIN				
					Wisconsin State Reformatory, Green Bay.....	10	1	3	..
					Wisconsin State Prison Hospital, Waupun....	21	5	..	5

PREVENTORIUMS

	Control	Bed Capacity	Patients Admitted	Census		Control	Bed Capacity	Patients Admitted	Census
ARIZONA					NEW JERSEY				
Pima County Preventorium, Tucson.....	County	130	185	..	Tuberculosis Preventorium for Children, Farmingdale	NPAasn	225	623	210
CALIFORNIA					NEW YORK				
Bloss Memorial Hospital, Atwater.....	County	51	..	..	Van Rensselaer Preventorium, Albany.....	NPAasn	50	..	41
Chas. S. Howard Foundation, Belmont....	NPAasn	20	..	..	Ontario County Preventorium, Canan- daigua	NPAasn	20	4	10
Thomas B. Swift Preventorium, Clayton..	County	21	53	..	Chemung	County	212	31	17
Kern County Preventorium, Keene.....	County	44	57	39	St. Agath	NPAasn	165	458	..
Monrovia Health Camp, Monrovia.....	NPAasn	90	61	64	NORTH DAKOTA				
Pasadena Preventorium, Pasadena.....	NPAasn	40	43	39	Ft. Totten Preventorium,* Ft. Totten....	Federal	80	100	65
Rest Haven Preventorium, San Diego.....	NPAasn	100	72	..	OHIO				
San Mateo Preventorium.....	NPAasn	28	15	18	Children's Fresh Air Camp and Hos- pital, Cleveland	NPAasn	60	222	40
DELAWARE					Nightingale Cottage, Reynoldsburg.....	NPAasn	40	..	..
Sunnybrook Cottage Preventorium, Mar- shallton	NPAasn	24	15	20	PENNSYLVANIA				
FLORIDA					River Crest Preventorium, Mont Clare... Preventorium Unit of Berks County Tuber- culosis Sanatorium, Reading.....	NPAasn	100	231	50
Hope Haven, Jacksonville.....	NPAasn	25	137	..	RHODE ISLAND				
GEORGIA					Lakeside Home and Mary Murray Preven- torium, Hoxsle	NPAasn	65	125	40
Kiwanis Sunshine Preventorium, Savannah	NPAasn	15	..	..	TENNESSEE				
ILLINOIS					Cheerfield Farm, Raleigh.....	CyCo	20	77	..
Ridge Farm Preventorium, Deerfield.....	NPAasn	48	100	..	VERMONT				
MASSACHUSETTS					Caverly Preventorium, Pittsford.....	NPAasn	80	166	75
Frederickst Preventorium, Boston.....	NPAasn	125	306	52	WISCONSIN				
MICHIGAN					Blue Mound Preventorium, Wauwatosa... ..	County	124	85	..
American Legion Children's Bilet, Otter Lake	NPAasn	20	..	..			
MINNESOTA									
Children's Preventorium of Ramsey County, St. Paul.....	CyCo	80	88	75					
MISSOURI									
Night and Day Camp for Children, St. St. Louis	NPAasn	81	24	..					

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 2, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

THE TUBERCULIN TEST AND X-RAYS IN MASS SURVEYS FOR TUBERCULOSIS

Tuberculin have been used successfully in the detection of primary and calcified tuberculous lesions for a generation. Nevertheless, discussion¹ still seeks to clarify their value, limitations and relation to the more accurate x-ray film. The problem is less one of ascertaining how many persons have been infected in a given community than to select for more careful study a relatively small number of suspected persons from a large number of people who are presumably well; especially is it important to isolate those with really active pulmonary lesions. In view of the general decline of tuberculosis and the lessened opportunity for reinfection, the

number of nonreactors to tuberculin may be expected to increase. Whether or not the percentage of the tuberculin positive in a community will decline proportionately with the death rate is problematic. Conceivably, tuberculin reactions may eventually become negative in all cases of calcified primary lesions if further infection does not occur.

The overwhelming majority of patients with frank tuberculosis react even to small doses of most tuberculins on the market. It is claimed that proved records do not exist of the development of the disease in the absence of a positive reaction and consequently that a negative tuberculin test excludes active tuberculosis with a high degree of probability. Tuberculin tests are regarded by individual proponents as diagnostically reliable in from 90 to 95 per cent of primary and calcified lesions in mass surveys in which special hazards do not exist. The failure to disclose the residual cases is attributed chiefly to the fact that persons previously tuberculin positive become tuberculin negative. Among 2,490 persons examined by the staff of the Henry Phipps Institute of the University of Pennsylvania and found positive to tuberculin on the first or a subsequent examination, 276 (11 per cent) became negative either transiently or for the remainder of the period of observation. The initial intensity of the disease and the degree of household exposure had much to do with the waning allergy. Tuberculin anergy in certain well known clinical conditions does not enter into the discussion. The conviction that the tuberculin test is rarely negative in the presence of significant tuberculosis acquires support from a survey of 500 adults tested at the Herman Kiefer Hospital, Detroit, with the x-rays in which nine failed to respond to the usual doses. Retesting by means of 10 mg. of old tuberculin brought out one more positive response. All of the nonreactors, except one, had the disease in the terminal stage. On the other hand, in a survey of 4,271 white persons with calcifications but without evidence of manifest tuberculosis conducted in Giles County, Tenn., the incidence of a tuberculin-negative response was 34.2 per cent. This lack of tuberculous specificity occurred at all ages. Results like these clearly place the burden of proof on the determination that all such lesions are tuberculous.

Tuberculin allergy may be so universal in adolescents and adults in certain geographic areas such as Puerto Rico that the tuberculin test has little validity beyond the age of 10. Possibly in mass surveys a large number of the population may refuse the needle, as in the survey at Hagerstown, Md., where 40 per cent voiced their refusal. It is conceded that tuberculin tests are unusually advantageous in infants because of the difficulty of securing uniformly good x-ray films of the chest. Their usefulness for control purposes is challenged in school children and adolescents because of the low incidence of active disease compared with the number of infections.

1. Long, Esmond R.; Douglas, Bruce, H.; Doull, James A.; Dearing, W. Palmer; Janne, Charles L., and Pastor, J. Rodriguez: A Symposium on Mass Tuberculin Testing and X-Raying, *Am. Rev. Tuberc.* 40: 607 (Dec.) 1939.

In 1,542 school children between the ages of 10 and 19 given the tuberculin test in Philadelphia, only fourteen cases of "manifest tuberculosis" were discovered, a ratio of 108 to 1. Single dose Mantoux testing is regarded by one investigator as a reasonably effective screen for case finding when the cost limits the number of x-ray examinations. Criticisms voiced against defects inherent in tuberculin testing, such as lack of standardization of tuberculin preparations, lack of uniformity of dosage and the varying classifications of the degree of reaction, are not new and will speed improvements of the technic.

The x-ray film is still the basic tool in case finding. An x-ray examination can be carried out with less inconvenience to the public and requires fewer visits. It possesses greater accuracy. The cost, to be sure, is greater. It is not free from certain imperfections, for it may reveal too much and again too little. Interference with accuracy may arise from the fact that not all calcium deposits discovered are tuberculous or that a complete view of the lung field may be obstructed by mediastinal and heart shadows or be due to the lack of experience required to interpret the film correctly. Ordinary lesions may often be present elsewhere than in the visual pulmonary field and reinfection may be hidden. The x-ray film, moreover, does not reveal infection until after it has caused a shadow in the lung. An instance is cited from the Santa Clara County Sanatorium at San Jose, Calif., in which a pregnant woman negative on x-ray examination proved positive to the tuberculin test. Further examination revealed that the husband harbored an occult minimal tuberculosis with positive sputum. A legitimate inference would be that a man's prophylaxis against tuberculosis, like his education, should begin before he is born. Only two deaths from tuberculosis in the first year of life have been reported since 1934 for Santa Clara County, with a mixed urban and rural population of 160,000. Early diagnosis permitted the early institution of collapse therapy and a normal pregnancy without extension of the pulmonary disease.

New types of x-ray examination intended to reduce the cost of mass surveys, such as the fluoroscope, sensitized paper, the use of 14 by 14 films instead of the usual 14 by 17 (resulting in a saving of 20 per cent in film cost) and miniature chest films made by photographing the fluoroscopic image on 4 by 5 inch films, offer inviting prospects of economy. The praise of the fluoroscope is sung as a case-finding mechanism for the geographic area in which tuberculin allergy in adolescents and adults is universal, and fluoroscopes are reported to be installed in every public health unit. A leading insurance company known for its investigations in public health is reported as having made fluoroscopic examinations of 25,000 persons at an average cost of 15 cents. It also found that an accurate diagnosis as to the presence or absence of pulmonary tuberculosis could be made with the fluoroscope alone in 87 per cent of

2,603 persons examined. In a cooperative survey made by the Michigan State Health Department, the U. S. Public Health Service and the Michigan Sugar Beet Growers Association, 4,000 Mexicans to be transported for summer work were examined with the newest type of portable fluoroscope and eighty-one cases of pulmonary tuberculosis were discovered. When the less expensive methods of x-ray examinations are perfected, the tuberculin test may be confined to the determination of tuberculous infections in infants and young children and to cases of atypical lesions in adults harboring tubercle bacilli. In doubtful cases, confirmation will continue to be sought in tuberculin, sputum analysis and other clinical evidence. Preliminary tuberculin screening may continue to hold the field for some time.

ALLERGY AND ANAPHYLAXIS IN TUBERCULOSIS

The debated question as to whether allergic and anaphylactic manifestations in experimental tuberculosis are basically similar or different has been reinvestigated by Corper.¹ His results strongly support the view that the phenomena are of fundamentally different nature. Significant facts partly here reported and partly cited seem to establish the following facts: Guinea pigs which receive intravenous injections of protein from tubercle bacilli are sensitized so that typical anaphylactic shock is caused by later injection of this protein. The sensitization can be transferred passively to normal guinea pigs with the blood. However, guinea pigs rendered "allergic" by infection with a strain of tubercle bacilli of low virulence do not demonstrate the characteristic anaphylactic type of hypersensitiveness when injected with the tuberculoprotein. In appropriate amounts the latter will kill such pigs, but only after several hours, a type of death in clear contrast to the rapidly occurring death of anaphylaxis.

By an ingenious experiment Corper was able to induce the two types of sensitization in the same animal. In a typical experiment a pair of guinea pigs were made allergically sensitive by infection with a millionth of a milligram of virulent human type tubercle bacilli. One of these had previously been given an anaphylactically sensitizing dose of tuberculoprotein. Three months after the infection with tubercle bacilli each pig was given 0.8 mg. of tuberculoprotein. The animal not sensitized before its injection died five hours later from the general reaction characteristic of allergy in the skin-sensitive animal. The other was thrown immediately into acute anaphylactic shock but recovered, only to die from the more protracted shock characteristic of allergic response and in exactly the same length of time as the other animal.

1. Corper, H. J.: Analysis of the Tubercle Bacillus and Its Natural Products by Immune, Allergic and Anaphylactic Tests, *J. Infect. Dis.* 66: 23 (Jan.-Feb.) 1940.

Naturally such an experiment should be repeated to make certain that the result can be considered a constant phenomenon. Corper's report, however, adds new evidence to the growing view that tuberculin allergy and anaphylactic shock are basically different. The results have definite connotations for our understanding of resistance, for, as he points out, the allergic sensitization is at least associated with increased resistance to infection, whereas animals sensitized only anaphylactically, by injection of the protein without infection, display no increased resistance. For the latter the bacillary body seems vital.

Current Comment

TUBERCULOSIS HOSPITALIZATION

In the survey of tuberculosis hospitalization by the Council on Medical Education and Hospitals published in this issue of *THE JOURNAL*, it is shown that the sanatoriums, tuberculosis departments and preventoriums admitted 122,342 patients in 1938, treated 202,021 and maintained an average daily census of 79,300. This represents an annual expenditure of over seventy million dollars for hospital care, not including the loss of earning power of the patients or the care of dependents. Tuberculosis is therefore still a great economic problem. The survey reveals also an increasing use of sanatorium facilities for far advanced cases, a trend which will aid in decreasing dangerous foci of infection. However, the continued hospitalization of nontuberculous children in some of the sanatoriums for adult tuberculosis is fraught with danger if separate units are not maintained. When additional beds are required for the care of patients it would seem logical to convert preventorium units to sanatorium use, for the isolation of open cases has proved more effective in the prophylaxis of tuberculosis than the hospitalization of tuberculous contacts. There are 98,801 beds available in this country for tuberculous patients, including 4,830 assigned to preventorium care. While additional beds are needed in various communities, the evaluation of sanatorium needs can better be assigned to members of the medical profession and other agencies familiar with local conditions. Institutional care is a vital factor in the prevention and treatment of tuberculosis. From an epidemiologic point of view, segregation and therapy accomplish the same result in removing foci of infection from the community, and that is the essence of tuberculosis control.

INTERNAL PRESSURE WAVES OF MUSCLE MOTION

To the physician abnormal spasms and dystrophy of muscles are significant in diagnosis. The tone of muscle is an index of health. Any contribution to the underlying mechanics of motion in muscles is clinically significant. A full explanation of muscular contraction involves research in histology, physiology, chemistry, roentgenology and other fields. There is no adequate explanation at present of the mechanism by which shortening, firmness and strength of muscle are pro-

duced, the nature of the energy thus transformed into mechanical work and the relation of this energy to the chemical reactions that take place in the stimulated muscle. The measurable manifestations of energy that are observed in the contracting muscle are the changes in chemical constitution, electrical potential, heat and mechanical work. The purely physiologic approach to the problem of motion in muscles pushes the refinements of analysis into time rather than space. Even if one knew precisely at what stage the chemical energy that is transformed into mechanical work is liberated one would still fail to know the actual machinery of contraction. The histologic method has made little advance in our knowledge of the structure of muscle during relative rest and variable degrees of motion. The recent demonstrations by Carey¹ that there is multiplication of the transverse muscle striae associated with a sudden rise in temperature within physiologic limits and that prolonged cooling results in subtraction point to an intimate association between these periodic muscle structures and the rate of rhythmic chemical change. The muscle striae are apparently not fixed static membranes but are the structural expressions of an underlying dynamic mechanism. Carey and Zeit,² furthermore, have demonstrated that the strongly active muscle fibers have their inorganic salts arranged in an alternate series of waves of condensations and rarefactions. Elsewhere in this issue of *THE JOURNAL*, Carey³ presents additional experimental evidence that different chemical reactions in gels confined within microscopic capillary glass tubules with dimensions approaching those of a skeletal muscle fiber are associated with periodic stratifications similar in arrangement and number to the cross striae and contraction waves in smooth and skeletal muscles. He observes a moving explosive wave front in the microcapillary glass tubules which he interprets as a result of the multiple microscopic pressure waves associated with the periodic mass action of chemical changes. The phenomenon of "interference," which is a crucial test of wave mechanics, appears to be demonstrated for both the striae in muscle and those in gels confined in microscopic glass tubules under adequate physical and chemical conditions. If future research confirms these observations and interpretations, a start will have been made in bridging the important gap in normal and abnormal muscle motions as regards the means by which chemical energy is transformed into mechanical energy. There appear to be concomitant microscopic waves of internal compression associated with chemical reactions. The detection of these micromechanical waves is dependent on confining the chemical reactions of the gel within a microcapillary tubular space which orients and concentrates the pressure waves expressed as alternate dark and light bands of variable number and patterns in both microscopic glass tubules and muscle fibers and fibrils.

1. Carey, E. J.: Thermal and Capillary Effects on the Quantitative Variability and Orientation of Muscle Cross Striae, *Anat. Rec.* 73 (supp. 2): 11 (March) 1939.

2. Carey, E. J., and Zeit, Walter: Micro-Incineration of Active Smooth, Transitional and Skeletal Muscles, *Proc. Soc. Exper. Biol. & Med.* 41: 31 (May) 1939.

3. Carey, E. J.: Liesegang and Muscle Pressure Waves, this issue, p. 753.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—S. 685, proposing to create a Bureau of Water Pollution Control in the Public Health Service, passed the Senate May 1, 1933, and was thereafter reported to the House of Representatives with recommendation that it pass. Among other things, this bill provided for federal grants-in-aid to assist states, municipalities and public bodies to construct treatment works to prevent pollution of navigable waters. On February 20 the House Committee on Rivers and Harbors recommended in a supplemental report that the grants-in-aid provision be stricken from the bill and that there be substituted an authorization whereby the Reconstruction Finance Corporation may make loans to finance the construction of treatment works.

Bills Introduced.—S. 3415, introduced by Senator Schwollenbach, Washington, proposes to authorize the Secretary of Interior to establish, construct, equip and operate a hospital for the legally adjudged insane of Alaska, the hospital to be constructed at Bellingham, Wash. H. R. 8378, introduced by Representative Lea, California, proposes that the Secretary of Labor be directed to cancel the outstanding order and warrant of deportation in the case of Dr. Filiberto A. Bonaventura. H. R. 8542, introduced, by request, by Representative May, Kentucky, proposes to authorize the appointment of female dietitians and female physical therapy aides in the Medical Department of the Army. H. R. 8547, introduced by Representative Starnes, Alabama, proposes to authorize loans to public bodies and nonprofit organizations for hospital, water, sewer, stream pollution control and related projects and facilities. H. R. 8613, introduced by Representative Van Zandt, Pennsylvania, proposes that any person who served as a member of the army nurse corps or of the navy nurse corps during the World War and continuously thereafter until May 13, 1926, and who was, prior to June 20, 1930, separated from the corps by reason of physical disability incurred in line of duty, shall, on her application therefor, be entitled to be placed on the retired list of the Nurse Corps. H. R. 8615, introduced by Representative Marcantonio, New York, proposes that the Works Progress Administration shall immediately employ not less than 3,000,000 persons and that there be created a Federal Unemployment Assistance Administration to distribute grants of unemployment assistance to the various states that have set up a state relief plan in compliance with the standards approved by the Unemployment Assistance Administration. Among other things, the bill provides, relief plans must provide medical or surgical treatment or care by physicians or institutions of the relief recipient's choice, subject to a schedule of uniform fees as determined by the local relief administration. H. R. 8631, introduced by Representative South, Texas, proposes a federal appropriation of \$450,000 to construct a domiciliary unit at the veterans' facility at Legion, Texas, of sufficient capacity to accommodate 400 veterans.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 3425, introduced by Senator King, Utah, and H. R. 8587, introduced by Representative Kennedy, Maryland, propose to provide for the reorganization of the Government of the District of Columbia. Among other things, these bills provide that in selecting a health officer the Commissioners of the District of Columbia may request the President of the United States to designate an officer from among the medical officers in the United States Army Medical Corps, the United States Navy Medical Corps or the United States Public Health Service, and that the President, in his discretion, may designate such an officer who shall, during the time specified by the President, be health officer of the District. These bills also propose to abolish the office of coroner and to establish the office of medical examiner to function under the direction of a chief medical examiner appointed by the Commissioners of the District and who must be "a doctor of medicine and a skilled pathologist

with not less than two years' actual experience as a pathologist." A new License Department, it is proposed, will be created in which will devolve the duties heretofore exercised by various boards, departments, offices and commissions, including the Commission on Licensure to Practice the Healing Arts. The Commissioners of the District will be authorized to appoint licensing and examining boards.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—H. 403 proposes that no physician, chiropractor, osteopath, chiroprapist, dentist or pharmacist shall practice his occupation or profession until he has first paid \$6 and obtained a license from the county court clerk of the county wherein he proposes to practice. H. 446 proposes to enact a law regulating the manufacture, sale, distribution and advertising of foods, drugs, cosmetics and therapeutic devices "which shall be uniform in principle with the Federal Food, Drug and Cosmetic Act of 1938 and with the Federal Trade Commission Act, to the extent to which it outlaws the false advertising of food, drugs, devices and cosmetics." S. 199 and H. 438 propose to regulate the construction and operation of hospitals, both private and governmental, and clinics and require them to be licensed annually by the state board of health.

Bill Passed.—H. 340 passed the house and senate to amend the law prohibiting the issuance of a license to marry unless each party to the proposed marriage presents a physician's certificate as to freedom from venereal disease by proposing that the physician's certificate must state that the party is free from any stage of syphilis infection which is or is likely to become communicable.

Mississippi

Bills Introduced.—H. 381 proposes to prohibit the retail sale or distribution of contraceptive devices or any prophylactic rubber or skin goods for the prevention of venereal diseases except by a licensed physician or a licensed pharmacist. H. 387 proposes to create a charity hospital to be known as the North Mississippi Charity Hospital and to be of sufficient size properly to care for 150 patients or more. H. 261 proposes that more than 0.15 per cent of alcoholic content in the blood shall be prima facie evidence of intoxication.

Bill Passed.—H. 150 passed the house, February 21, proposing to prohibit the retail sale or distribution of barbituric acid and any compound, manufacture, salt, derivative, mixture or preparation of barbituric acid, except on the written prescription of a licensed physician, dentist or veterinarian. The bill further proposes to make it unlawful for any person to have in his possession or custody any drug or medicine containing any quantity of barbituric acid, unless it has been prescribed by a physician, dentist or veterinarian.

New York

Bills Introduced.—S. 1100 and A. 1339 propose to provide a public expense for the correction by surgical or medical treatment and care, or by hospitalization, of remedial physical defects or remedial physical disability of physically handicapped adults unemployed persons in such manner as reasonably may be expected to fit them for remunerative occupations or employment. A. 1477, to supplement the workmen's compensation act, proposes that every employee mentally disabled as a result of an accident arising out of and in the course of his employment shall be entitled to receive, without any deductions from the amount of compensation payable to him, medical care, maintenance and attendance in a public hospital or institution, at the expense of his employer, until such time as the employee is discharged as cured. S. 1220 proposes to permit the sale of hypodermic syringes and hypodermic needles to podiatrists, without the written order of a duly licensed physician or veterinarian.

Rhode Island

Bill Introduced.—S. 131 proposes to grant to physicians treating persons injured by reason of an accident not covered by the workmen's compensation act liens on all rights of action, judgments, settlements or compromises accruing to the injured persons by reason of their injuries.

Virginia

Bills Introduced.—S. 253 proposes to authorize the operation of such nonprofit hospital and medical service plans as may be

approved by the state corporation commission. H. 338 proposes to appropriate annually to the state board of health \$1,000 for the purchase and distribution without charge of insulin to licensed physicians treating indigent patients suffering from diabetes mellitus. S. 186 proposes that whenever in a civil or criminal proceeding issues arise on what the court deems expert evidence desirable the court may, on its own motion or on the motion of either party to the proceeding, appoint one or more experts, not exceeding three on each issue, to testify at the trial.

OFFICIAL NOTES

THE NEW YORK SESSION

Hotels in New York

On advertising page 41 of this issue of THE JOURNAL is printed a list of New York hotels and rates for rooms that has been furnished by the Subcommittee on Hotels of the Local Committee on Arrangements.



The form printed in the advertising pages may be clipped and, when it has been properly filled in, should be sent at once to Dr. Peter Irving, Chairman of the Subcommittee on Hotels of the Local Committee on Arrangements, Room 1036, 233 Broadway, New York.

Meeting Places

Meeting places at the annual session of the American Medical Association, to be held in New York June 10 to 14, will be as follows:

HOUSE OF DELEGATES: The Waldorf-Astoria, Basildon and Jade rooms.

GENERAL SCIENTIFIC MEETINGS: The Waldorf-Astoria, Ballroom, and the Commodore, Grand Ballroom.

REGISTRATION AND SCIENTIFIC AND TECHNICAL EXHIBITS: Grand Central Palace.

SYMPOSIUM ON HEALTH EDUCATION: Hotel Roosevelt, Grand Ballroom.

WOMAN'S AUXILIARY: Hotel Pennsylvania.

SECTIONS OF THE SCIENTIFIC ASSEMBLY

PRACTICE OF MEDICINE: The Waldorf-Astoria, Ballroom.

SURGERY, GENERAL AND ABDOMINAL: The Commodore, Grand Ballroom.

OBSTETRICS AND GYNECOLOGY: The Commodore, Grand Ballroom.

OPHTHALMOLOGY: Hotel Roosevelt, Grand Ballroom.

LARYNGOLOGY, OTOLOGY AND RHINOLOGY: Hotel Roosevelt, Grand Ballroom.

PEDIATRICS: The Waldorf-Astoria, Ballroom.

PHARMACOLOGY AND THERAPEUTICS: The Biltmore, Music Room.

PATHOLOGY AND PHYSIOLOGY: The Biltmore, Music Room.

NERVOUS AND MENTAL DISEASES: The Biltmore, Ballroom.

DERMATOLOGY AND SYPHILOLOGY: The Commodore, West Ballroom.

PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH: Hotel Roosevelt, Hendrik Hudson Room.

UROLOGY: The Commodore, West Ballroom.

ORTHOPEDIC SURGERY: The Biltmore, Ballroom.

GASTRO-ENTEROLOGY AND PROCTOLOGY: Hotel Roosevelt, Hendrik Hudson Room.

RADIOLOGY: The Commodore, East Ballroom.

MISCELLANEOUS TOPICS, SESSION ON ANESTHESIA: The Commodore, East Ballroom.

ADDRESSES BY OFFICIAL STAFF

DR. PAUL C. BARTON:

March 19—Open meeting under auspices of St. Joseph Clinical Society, St. Joseph, Mo.

March 20—St. Joseph Clinical Society.

March 20—Woman's Auxiliary to Buchanan County Medical Society, St. Joseph, Mo.

DR. W. W. BAUER:

March 4-5—General Advisory Committee on Maternal and Child Welfare Services, Children's Bureau, Washington, D. C.

March 10—College Klub, Evanston, Ill.

March 11—Automotive Boosters Club No. 7, Chicago.

March 12—Bryn Mawr Parent Teacher Association, Chicago.

March 26—Allegheny County Medical Society Auxiliary, Pittsburgh.

April 1—Woman's Club, Stevens Point, Wis.

April 1—Rotary Club, Stevens Point, Wis.

April 1—High School, Stevens Point, Wis.

April 2—Portage County Medical Society and Auxiliary, Stevens Point, Wis.

April 2—Teacher's College, Stevens Point, Wis.

April 2—Kiwanis Club, Stevens Point, Wis.

April 3—Wilmette Woman's Club, Wilmette, Ill.

DR. MORRIS FISHBEIN:

March 3—Bloomington Forum, Bloomington, Ill.

March 5—Fort Smith Junior College, Fort Smith, Ark.

March 10—South Parkway Branch of the Y. W. C. A., Chicago.

March 11—Uniontown Community Forum, Uniontown, Pa.

March 14—Illinois State Medical Society, Danville, Ill.

March 20—Temple Isaiah Israel, Chicago.

March 26—Executives Club, Knoxville, Tenn.

March 27—Executives Club, Chattanooga, Tenn.

March 31—Academy of Medicine, Rochester, N. Y.

DR. R. G. LELAND:

March 2—Professional Students Clinic, Y. M. C. A., Chicago.

DR. PAUL A. TESCHNER:

March 4—North End Woman's Club, Chicago.

March 6—Marinette County Medical Society Auxiliary and Woman's Club, Marinette, Wis.

DR. NATHAN B. VAN ETEN:

March 2—Dinner to Dr. Emily Barringer by Kingston Hospital at New York Academy of Medicine, New York.

March 6—Lecture on Ethics, New York University School of Medicine, New York.

March 9—Dinner Class of 1890, Bellevue Hospital Medical College, New York.

March 11—New York Society of Medical Jurisprudence, New York.

March 13—Lecture on Ethics, New York University School of Medicine, New York.

March 14—West Side Clinical Society, New York.

March 19—American Dental Association, Baltimore.

March 25—Radio Broadcast, New York University, New York.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Personal.—Dr. Roy J. Settle, formerly of Inman, S. C., has been elected health officer of Clarke County, succeeding Dr. Benjamin S. Black, Grove Hill, who resigned to enter private practice in Chicago.—Dr. John A. Kenney, formerly medical director of the Community Hospital, Newark, N. J., has been appointed to a similar position at the John A. Andrew Memorial Hospital, Tuskegee Institute.—Franklin A. Clark, of the U. S. Public Health Service, has been appointed director of the division of inspection of the state department of health, succeeding C. A. Abele, Ch.E., who left to become director of the division of dairy products of the Chicago Board of Health, newspapers reported, January 18.—Dr. William M. Askew Jr., formerly of Auburn, has been named health officer of Butler County, succeeding Dr. Thomas C. Elliott, Greenville, resigned.

CALIFORNIA

Course in Psychotherapy.—Announcement is made that the course on psychotherapy in general practice at Mount Zion Hospital, San Francisco, will be given March 7, 14, 21 and 28 instead of March 6, 13, 20 and 27 as heretofore announced. Additional information may be obtained from Dr. Jacob Kasanin, chief of the psychiatry service at the hospital, corner of Post and Scott streets, San Francisco.

Director of Child Guidance Clinic.—Dr. Hale F. Shirley, assistant professor of psychiatry, State University of Iowa College of Medicine, Iowa City, has been appointed assistant professor of psychiatry and pediatrics and director of the new child guidance clinic at Stanford University School of Medicine. The Commonwealth Fund recently gave a grant of \$10,000 a year for three years to finance the clinic under the direction of the departments of psychiatry and pediatrics. The new clinic will be an expansion of the present work on behavior problems and will provide opportunities for graduate and undergraduate training of physicians in this field. Dr. Shirley graduated at the State University of Iowa College of Medicine in 1927.

Society News.—Dr. Charles E. Smith, San Francisco, addressed the Kern County Medical Society in Bakersfield, January 18, on "Coccidioid Granuloma in Relation to Erythema Nodosum."—At a meeting of the Riverside County Medical Association in Riverside, January 8, Dr. Robert W. Lamson, Los Angeles, spoke on "Allergy in General Practice."—Dr. Charles W. Barnett, San Francisco, discussed treatment of syphilis before the Yuba-Sutter Medical Society in Marysville, January 9.—At a meeting of the Los Angeles Society of Ophthalmology, February 26, the speakers included Drs. Helen L. Hopkins on "Hysterical Amblyopia in Children" and Harry F. Dietrich, "Arterial Hypertension in Children."—The Los Angeles Heart Association was addressed, February 14, among others, by Drs. Robert W. Langley on "Mediastinal Tumor Associated with Auricular Fibrillation" and Edward W. Boland, "Oxygen for the Relief of Pain in Coronary Thrombosis."

CONNECTICUT

Dr. Bayne-Jones Declines Reappointment as Dean.—Dr. Stanhope Bayne-Jones, since 1935 dean of Yale University School of Medicine, New Haven, has found it impossible to accept reappointment to this position, it is announced. His time will be devoted to other positions as chairman of the executive committee of the division of medicine and public health of the president's committee on university development, as director of the board of scientific advisers of the Jane Coffin Childs Memorial Fund for Medical Research and as professor of bacteriology. Dr. Bayne-Jones was chosen unanimously for reappointment by his colleagues on the board of permanent officers of the medical school, by the president and by the corporation of the university. He graduated at Yale in 1910 and from Johns Hopkins University School of Medicine in 1914. He joined the Yale faculty in 1932. He has served as professor of bacteriology, University of Rochester School of Medicine, Rochester, N. Y., and director of the Rochester Health Bureau Laboratories, among other activities. He was

chairman of the division of medical sciences, National Research Council, 1932-1933; member of the Council on Pharmacy and Chemistry of the American Medical Association, 1930-1934, president of the Society of American Bacteriologists, 1929-1930, and of the American Association of Immunologists, 1930-1931.

DISTRICT OF COLUMBIA

Life Membership in District Society.—Eight members of the Medical Society of the District of Columbia were recently elevated to life membership. The eight physicians are Drs. Thomas Dowling, Wilmington, Del.; Thomas A. Groover, Robert S. Lamb, Carl S. Keyser, Frederick H. Mohant, Charles S. White, Harry Hurtt and Henry A. Polkinhorn. To receive this honor it is necessary to be an active member of the society for forty years.

Society News.—The Medical Society of the District of Columbia was addressed, February 28, by Drs. George W. Thorn, Baltimore, on "Clinical Considerations Regarding the Use of Desoxycorticosterone Acetate Therapy in Addison's Disease" and Alva D. Daughton, "Simmond's Disease: Presentation of a Proved Case with Consideration of a Differential Diagnosis." The section on gastro-enterology presented a symposium and panel discussion on peptic ulcer before the society, February 14; the speakers were Drs. Ernest H. Gaither, Baltimore, on "Comparative Analysis of the Results of Various Forms of Medical Management of Peptic Ulcer" and George P. Müller, Philadelphia, "End Results and the Surgical Approach to Peptic Ulcer."—Dr. Francis C. Wood, Philadelphia, discussed "Coronary Diseases" before the naval medical and dental officers on duty in the District of Columbia and vicinity at the U. S. Naval Medical School, Washington, February 5.

ILLINOIS

Postgraduate Conference.—The third of a series of postgraduate conferences sponsored by the Illinois State Medical Society will be held at DuQuoin, March 7. Dr. Gilbert H. Edwards, Pinckneyville, president of the Perry County Medical Society, will preside. The speakers will include:

Dr. Andy Hall Jr., St. Louis, Urinary Tract Infections.
Dr. Clinton W. Lane, St. Louis, Diagnosis and Treatment of the Common Skin Diseases.
Dr. Joseph C. Jaudon, St. Louis, Problems of the Newborn.
Dr. Robert S. Berghoff, Chicago, heart clinic (four patients).
Dr. Frederick H. Falls, Chicago, Management of Abortion.
Dr. Francis J. Dean Sauer, St. Louis, Hand Infections, Diagnosis and Treatment.
Dr. Philip H. Kreuscher, Chicago, Fracture Problems.
Dr. Charles W. Mayo, Rochester, Minn., Preoperative and Postoperative Care of the Surgical Case.
Dr. James H. Hutton, Chicago, Diagnosis of Endocrine Disorders.
Dr. Edwin S. Hamilton, Kankakee, Voluntary Health Insurance in Illinois.

Chicago

Public Meeting on Cancer.—Plummer Memorial Lecture.—The Henry Schmitz Memorial Lecture will be delivered by Dr. Francis Carter Wood at a public meeting, March 6, sponsored by the cancer research committee of the Chicago Woman's Club and the Chicago Medical Society. Dr. Wood will discuss cancer. The meeting will be held at the woman's club following an all day clinical session. At 6:30 the Chicago Medical Society will hold a reception and dinner in honor of Dr. Wood, who is director of the Institute of Physicians and Research at Columbia University College of Physicians and Surgeons, New York. Dr. James Randolph Webster, clinical instructor in dermatology, Rush Medical College, will deliver the Mary Redfield Plummer Memorial Lecture, March 7, at the woman's club on "Primary Cancer of the Skin."

Selection of Pioneer Physicians.—In an address at the Rosenwald Museum of Science and Industry, January 9, Dr. William Allen Pusey, Chicago, a former President of the American Medical Association, gave his choice of the chief leaders of Chicago's early medical history. They include:

Daniel Brainard, 1835 to 1866.
John Evans, 1845 to 1858.
Nathan S. Davis, 1849 to 1904.
John H. Rauch, 1857 to 1894.
Christian Fenger, 1878 to 1902.
Frank Billings, 1881 to 1932.
Ludvig Hektoen, 1887 to the present.

The lecture, entitled "High Lights in the History of Chicago Medicine" was presented under the auspices of the Chicago Historical Society, the Society of Medical History of Chicago and the Institute of Medicine of Chicago. Following the lecture a reception was held in honor of Dr. and Mrs. Pusey and a tour made to see the medical exhibits at the museum which are being transferred into new quarters.

MEDICAL NEWS

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Branch Meetings.—The Evanston Branch of the Chicago Medical Society was addressed by Dr. Burton C. Corbus Jr., February 1, on "Clinical Evaluation of Testosterone Propionate"; Drs. Richard H. Young and Robert P. Gilbert, "Use of Aminophylline for Control of Bronchial Spasm," and Dr. Seth E. Brown, "Use of a Hospital Blood Bank." A symposium on peripheral vascular disease was presented before the North Shore Branch, February 6, by Drs. Louis G. Herrmann, Cincinnati, Frank V. Theis and Samuel Perlow. The branch will be addressed, March 5, by Drs. Russell L. Hayden, Cleveland, on "Some Aspects of Polycythemia of General Interest" and Charles A. Doan, Columbus, "The Reticulo-Endothelial System." The North Side Branch was addressed, February 1, by Drs. Ray F. Farquharson, Toronto, on "Hypopituitarism with Special Reference to Simmond's Disease" and Edward H. Rynearson, Rochester, Minn., "A Skeptic Looks at Endocrinology." Dr. C. Sidney Burwell, Boston, will address this branch and the Chicago Medical Society, March 7, at the Drake Hotel on "The Effect of Pregnancy on the Management of Heart Disease." Dr. W. Wayne Babcock, Philadelphia, will discuss "Diagnosis and Management of Inflammatory and Neoplastic Growths of the Colon" before the Englewood Branch, March 5.

Personal.—Dr. Roy H. Holmes, Muskegon, was elected editor of the state medical journal at a meeting of the council of the Michigan State Medical Society in January. He succeeds Dr. James H. Dempster, who resigned in December after serving in the position for twelve years. Dr. Dempster was presented recently with a scroll in recognition of his long service to the society.—Dr. Richard H. Lyons, Ann Arbor, has been appointed medical director of the Dr. William J. Seymour Hospital, the medical unit of Eloise Hospital and Infirmary, Eloise.

New Ophthalmologic Society.—The Detroit Ophthalmologic Society was organized at a meeting in the headquarters of the Wayne County Medical Society, Detroit, January 30. There will be five classes of membership: active, associate, honorary, life and special members. The officers elected are Drs. Parker Heath, professor of ophthalmology, Wayne University College of Medicine, president; Ralph H. Pino, president-elect; Leland F. Cooper, secretary; Cecil W. Lepard, treasurer; Edmond L. Carter, recorder. Honorary presidents are Drs. Don M. Campbell and Walter R. Parker. Dr. Campbell served as professor of ophthalmology at Wayne for more than forty years and Dr. Parker for twenty-eight at the University of Michigan Medical School, Ann Arbor.

LOUISIANA

Personal.—Dr. John H. Musser, New Orleans, received the Alumni Award of Merit of the University of Pennsylvania School of Medicine, Philadelphia, on Founder's Day, January 17, as part of the observance of the bicentennial of the university. Dr. Musser graduated in 1908.

Society News.—A symposium on pneumonia was presented before the Orleans Parish Medical Society, January 22, by Drs. Andrew V. Friedrichs, Stanford Chaille Jamison, Meyer D. Teitelbaum and Joseph O. Weilbaecher Jr.—Dr. Daniel N. Silverman, New Orleans, addressed the East Baton Rouge Medical Society recently on "Carcinoma of the Stomach."—A symposium on cutaneous diseases was presented before the Jefferson Davis Parish Medical Society at Jennings recently by Drs. James K. Howles, James W. Tedder and Charles Barrett Kennedy.

District Meetings.—The Fifth District Medical Society was addressed in Monroe recently among others by Drs. John L. Elliott, New Orleans, on "Memoirs of Forty-Five Years' Practice of Internal Medicine"; Edward N. Cook, Rochester, Minn., "Transurethral Prostatic Resection," and Henry Ashton Thomas, New Orleans, "Rhinologic and Otologic Problems of the General Practitioner."—At a meeting of the Third District Medical Society in New Iberia recently the speakers included Drs. Charles S. Holbrook and Leon J. Menville, New Orleans, on "Differentiating Depressive Reactions from Somatic Diseases" and "Present Day Methods of Diagnosing Tumors of the Breast" respectively.

MASSACHUSETTS

Society News.—The Boston Tuberculosis Association, the Southern Middlesex Health Association and the Trudeau Society of Boston held a joint meeting in Boston, January 25; following the business meetings of the tuberculosis and health associations Dr. Edward G. Huber spoke on "Tuberculosis as a Future Public Health Problem." In the evening Dr. Charles L. Jackson, Philadelphia, addressed the Trudeau Society of Boston on "Bronchoscopy in the Diagnosis and Treatment of Thoracic Disease."—Among others, Drs. John P. Hubbard and Robert E. Gross, Boston, addressed the Suffolk District Medical Society, January 31, on "Criteria for Ligation of the Patent Ductus Arteriosus in the Light of the First One and a Half Years' Experience."—Dr. Harry Linenthal, Boston, addressed the New England Heart Association, January 29, among others, on "Clinical and Pharmacologic Observations in Paroxysmal Ventricular Tachycardia."—The New England Society of Physical Medicine was addressed, January 31, by Mr. A. Philip Mooradian, New York, on "Comparative Physics of Long-Wave and Short-Wave Diathermy Generators."

MICHIGAN

The Henry Russel Lectureship.—Dr. Frank N. Wilson, professor of internal medicine, University of Michigan Medical School, Ann Arbor, was awarded the Henry Russel Lectureship in December. The lectureship is considered the highest university award and was established by the late Henry Russel, Detroit, a member of the class of 1873. Dr. Wilson will deliver the lecture at the university on May 2. The tentative title of his lecture is "The Electrical Currents Produced by the Human Heart."

MINNESOTA

Special Course in Pathology.—A course entitled "Surgical Pathology with Special Attention to Tumors" will be offered at the University of Minnesota Medical School, June 19-July 26. It is the same course presented by the university last summer by Dr. James S. McCartney, associate professor of pathology.

Society News.—The Hennepin County Medical Society was addressed in Minneapolis, February 21, by Drs. Joseph Michael and Nathaniel J. Berkwitz on "Pharmacologic Shock Therapy" and "Faradic Shock Treatment in Functional Psychoses" respectively.—Dr. Sumner L. S. Koch, Chicago, addressed the eighteenth annual dinner of the Minneapolis Surgical Society in Minneapolis, February 1, on "Transplantation of Skin and Subcutaneous Tissue to the Hand." Dr. Koch was presented with a certificate of honorary membership following his lecture.—Dr. Carl J. Wiggers, professor of physiology, Western Reserve University School of Medicine, Cleveland, gave a Mayo Foundation lecture, February 8, on "Ventricular Fibrillation."

MISSISSIPPI

Regional Meeting on Pediatrics.—The annual meeting of region II of the American Academy of Pediatrics will be held at the Edgewater Gulf Hotel, Edgewater Park, March 15-16. Region II of the academy comprises the southern states from Virginia to Texas.

Birmingham Physicians Give Program.—The following program was presented by Birmingham physicians before the Central Medical Society of Mississippi at Jackson recently: Dr. Ellis Dice Lineberry, A Consideration of the Individual Along with His Disease—Three Case Reports.
Dr. James S. McLester, The Commoner Forms of Nutritive Deficiency.
Dr. Thomas M. Boulware, Hydatidiform Mole.
Dr. Paul W. Shannon, Compound Fractures.
Dr. Wallace A. Clyde, Clinical Experience in the Treatment of Meningitis.
Dr. John L. Carmichael, Breast Tumors.

NEBRASKA

Personal.—Dr. Arthur C. Stokes has retired after more than thirty years as medical director of the Guarantee Mutual Life Insurance Company of Omaha. Dr. James P. Donelan, formerly of Los Angeles, is his successor.—Drs. Joseph E. Dunn and Frank A. Burnham, Arnold, were honored at a public meeting on January 18. The two physicians were presented with quilts on which were embroidered the names of several hundred persons at whose births they had officiated.

Society News.—Drs. Herschel B. Morton and E. Burkett Reed, Lincoln, addressed the Madison Six County Medical Society in Norfolk, January 16, on "Diagnosis and Treatment of Intestinal Obstruction: with Special Emphasis on the Miller-Abbott Tube" and "Iron Deficiency Anemias" respectively.—Drs. C. M. Miller, Kimball, president of the Nebraska State Medical Association, "The Physician's Public Relationship"; Wayne M. Hull, Oklahoma City, "Inhalation Therapy," and Frederick W. Niehaus, Omaha, "Rheumatic Heart Disease."

NEW YORK

Society News.—Dr. David Wolin, Rochester, addressed the Rochester Pathological Society, January 9, on "Clinical Aspects of Blood Diseases in Children."—The Medical Society of the County of Monroe, the Rochester Academy of Medicine and the University of Rochester School of Medicine sponsored a public meeting, January 28, with John R. Murlin, Ph.D., professor of physiology at the university, as the speaker on "The Place of Vitamins in Normal Nutrition."—Drs. Daniel B. Peeler and John A. Lichty Jr., addressed the Rochester Pediatric Society, January 12, on "Hypoglycemia" and "Recent Studies of Nephritis" respectively.

New York City

Science Writer Honored.—William L. Laurence, science news reporter of the *New York Times*, received the 1940 fellowship of the American Institute of the City of New York at a dinner at the Hotel Pierre February 1. Mr. Laurence was presented for the award by Oscar Riddle, Ph.D., of the research staff of the Carnegie Institution for Experimental Evolution, Cold Spring Harbor, L. I. His citation was "for a long-sustained pre-eminent record of reporting brilliantly to the daily press the achievements of science and technology."

Meeting on Tuberculosis and Heart Disease.—The thirty-eighth annual meeting of the New York Tuberculosis and Health Association, including the Tuberculosis Sanatorium Conference of New York and the New York Heart Association, will be held at the Hotel Pennsylvania March 5. Among the speakers will be:

Drs. James Burns Amberson Jr. and Carl Muschenheim, Detecting and Controlling Tuberculosis Among Hospital Personnel.

Dr. Herbert R. Edwards and Mr. Matthew Woll, third vice president, American Federation of Labor, The Labor Unions in Tuberculosis Control.

Dr. Henry D. Chadwick, Boston, The Tuberculosis Program in These Changing Times.

Dr. Homer F. Swift, Public Health Aspects of Rheumatic Disease.

A symposium on rheumatic fever will be presented by Drs. Thomas Duckett Jones, Boston; John R. Paul, New Haven, Conn., and Miss Edith Terry of the Massachusetts General Hospital, Boston.

Society News.—Dr. Harold G. Wolff will give the Friday afternoon lecture at the New York Academy of Medicine, March 8, on "Medical Treatment of Pain" instead of Dr. Walter L. Niles, as originally announced.—Drs. Terry M. Townsend, president of the Medical Society of the State of New York, and Richard B. Cattell, Boston, addressed the Medical Society of the County of Kings, Brooklyn, February 20, on "Who Shall Lead the Leaders?" and "Surgical Management of Diseases of the Biliary Tract," respectively. This society is presenting courses in contemporary medicine on Monday afternoons from March 4 to May 13. Subjects are allergy, tuberculosis, nontuberculous pulmonary disease, hematology, metabolism and nutrition.—Drs. Harry S. Gradle, Chicago, and Alfred Cowan, Philadelphia, addressed the Brooklyn Ophthalmological Society, February 15, on "Glaucoma Capsulare" and "Correction of Refractive Errors in Children" respectively.—Dr. Herbert S. Gasser was elected president of the Harvey Society at the annual meeting, January 26; Homer W. Smith, Sc.D., vice president, and Dr. Thomas Francis Jr., secretary, reelected.—Dr. Jacob M. Gersberg was recently reelected president of the International Spanish-Speaking Association of Physicians, Dentists and Pharmacists and Dr. James W. Babcock II, secretary.—Drs. George C. Adie, New Rochelle, and Cameron Haight, Ann Arbor, Mich., addressed the New York Society for Thoracic Surgery, February 9, on "Observations on Thoracoplasty for Treatment of Pulmonary Tuberculosis" and "Extrapleural Pneumothorax" respectively.—At a meeting of the American Society of Anesthetists, February 14, the speakers were Dr. Ralph M. Waters, Madison, Wis., on "Pain Relief in Obstetrics" and Detlev W. Bronk, Ph.D., Philadelphia, "The Influence of Anesthetics on the Activity of Nerve Cells."

OREGON

Society News.—Dr. Donald M. Long, Marshfield, addressed the Coos-Curry Counties Medical Society, Marshfield, January 10, on "Perforated Gastric Ulcers."—Drs. Moses E. Steinberg and Isidor C. Brill addressed the Multnomah County Medical Society, Portland, February 7, on "Problems in Gastric Surgery" and "Circulatory Failure with Special Reference to Digitalis" respectively.

Spring Course in Ophthalmology and Otolaryngology.—Drs. Meyer Wiener, professor of clinical ophthalmology, Washington University School of Medicine, St. Louis, and Marvin F. Jones, formerly professor of otolaryngology, New York Post-Graduate Medical School, will be the guest speakers at the fifth annual spring postgraduate course of the Oregon Academy of Ophthalmology and Otolaryngology. The course will be given in cooperation with the University of Oregon Medical School in Portland, April 1-6.

PENNSYLVANIA

Hospital Changes.—Dr. Thomas I. Cotton has resigned as superintendent of Selinsgrove State Colony for Epileptics, Selinsgrove. Dr. Ronald B. McIntosh, formerly on the staff of Norristown State Hospital, Norristown, is his successor.

Search for Meningitis Carriers.—Seven carriers of the organism of spinal meningitis have been found in and near Wilkes-Barre in Luzerne County, where forty-seven deaths from the disease have occurred since last September, according to newspaper reports. Plans were being made to examine 2,500 employees of a coal company in the area after it appeared that most of the cases occurred in families associated with mining.

Society News.—Dr. John P. Henry, Pittsburgh, addressed the Cambria County Medical Society, Johnstown, February 8, on "Diseases of the Peripheral Arteries and Veins."—Drs. Michael Fresoli and Harry A. Rothrock Jr., Bethlehem, addressed the Northampton County Medical Society, February 16, at the Northampton Country Club on "Present Day Treatment of Pneumonia" and "The Laboratory in Pneumonia" respectively.—Dr. Barton R. Young, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, February 13, on "Roentgenology and the General Practitioner."—Dr. Joseph M. Shelton, Washington, addressed the Washington County Medical Society, Washington, February 14, on common diseases of the skin.

Philadelphia

Temple Alumni Meeting.—The Midwinter Alumni Day of the Medical Alumni Association of Temple University was held, February 29, with a program at the university hospital and the medical school during the day and dinner at the Hotel Warwick in the evening. Dr. Frank H. Lahey, Boston, was the guest speaker, presenting addresses on "Management of Thyroid Disease" and "Some of the Newer Developments in Surgery."

Joint Surgical Meeting.—The annual joint meeting of the New York Surgical Society and the Philadelphia Academy of Surgery was held in Philadelphia, February 14, with the following speakers: Drs. Eldridge L. Eliason and Julian Johnson on "Acute Regional Enteritis"; Hubley R. Owen, John Paul North and Lewis C. Manges Jr., "Fractures of the Shaft of the Humerus," and Thomas A. Shallow, "The Operative Technic of Pulsion Pharyngeal Diverticulum and Traction Diverticulum of the Esophagus." Drs. Richard H. Meade Jr., Joshua Montgomery Deaver, Gilson C. Engel and Hans May presented case reports.

Personal.—Dr. Thomas S. Dunning, aged 92, was honored by the Dickinson Club of Philadelphia, January 10, as the oldest living alumnus of Dickinson College. He was graduated in 1867.—Dr. John Claxton Gittings received the degree of bachelor of arts from the University of Pennsylvania, February 17, as a member of the class of 1894, by a special request of that class addressed to the president of the university. It was said that when Dr. Gittings was a sophomore he was compelled to drop out of the university because of his eyes. Instead of completing his academic work he went directly to medical school, graduating in 1895.

Lectures on Genetics.—The Woman's Medical College of Pennsylvania is presenting a series of lectures on "Medical Genetics," made possible by a gift from an alumna of the class of 1889. Charles B. Davenport, Ph.D., of the Carnegie Institution laboratory at Cold Spring Harbor, N. Y., delivered the first lecture, February 26, on "Human Variability and Mass Selection." Dr. Davenport will give the second, March 4, on "Some Social Applications in Eugenics." On March 11 there will be four speakers at an afternoon meeting:

Dr. Davenport, Heredity in Relation to Medicine.
Clyde E. Keeler, Sc.D., Boston, The Value of Animal Experiments in the Understanding of Human Genetics.
Maud Slye, Sc.D., Chicago, Genetics and Cancer.
Dr. Madge Thurlow Macklin, London, Ont., The Value of Medical Genetics to the Clinician.

Pittsburgh

Society News.—Speakers before the Allegheny County Medical Society, February 20, were Drs. James Everett McClenahan on "Intestinal Intubation; Its Application in Intestinal Obstructions"; Sidney A. Rosenberg, "Results in Reconstructive Surgery," and Daniel P. Greenlee, "Malignancy of the Gallbladder." Dr. Floyd H. Bragdon presented a motion picture on "Surgical Treatment of Paroxysmal Convulsive Disorders."—Drs. John Huber Wagner and Stuart N. Rowe addressed the Pittsburgh Surgical Society, February 6, on "Periarticular Adhesions of the Shoulder Joint with Treatment by Manipulation" and "Osteomyelitis" respectively.—Dr. Maud L. Menten, among others, addressed the Pittsburgh Pediatric Society, February 9, on "Childhood Anemias Associated with Erythroblastosis."—At a meeting of the Pittsburgh Urological Association, February 12, the speakers were Drs. Stacy M. Hankey, Pittsburgh, and Louis Bernstein, Aspinwall, on "Conservative Treatment of Hydronephrosis" and Clifford M. Lane on "Polycystic Disease of the Kidney."—Dr. Richard B. Cattell, Boston, gave the R. W. Stewart Memorial Lecture of the Pittsburgh Academy of Medicine, February 13, on "Carcinoma of the Rectum."

GENERAL

Grants for Research in Sex.—Applications to the National Research Council for funds to support study of fundamental problems of sex and reproduction should be received before April 1, according to a notice in *Science*. They may be addressed to the chairman of the committee for research in problems of sex, Robert M. Yerkes, Sc.D., Yale University School of Medicine, New Haven, Conn. Preference will be given to proposals for the investigation of neurologic, psychobiologic and behavior problems.

All Expense Tour to Federation Meeting.—Dr. Arno B. Luckhardt, professor of physiology, University of Chicago, is sponsoring an all expense tour for persons attending the annual meeting of the Federation of American Societies for Experimental Biology, New Orleans, March 13-16. The tour will leave Chicago Monday morning March 11 and arrive in New Orleans Tuesday morning March 12. Information may be obtained from Dr. Luckhardt, Department of Physiology, University of Chicago, Chicago.

Delegates to the Pharmacopeial Convention.—All medical schools and medical societies who expect to send delegates to the U. S. Pharmacopeial Convention to be held in Washington, D. C., May 14-16, should send the credentials to the board of trustees of the U. S. Pharmacopeia before March 15. If the blank forms have been misplaced, duplicate copies may be obtained by addressing E. Fullerton Cook, Philadelphia College of Pharmacy and Science, Philadelphia, chairman of the Revision Committee of the U. S. Pharmacopeia.

Impostor Victimizes Physicians.—The California State Board of Medical Examiners reports that an impostor has been victimizing professional and business men by fraudulent checks drawn on the Crawford County Trust Company, Meadville, Pa. He usually approaches his victims by announcing that he proposes to open an office as a physician specializing in surgery. The man is said to be about 38 years old and 5 feet 6 or 7 inches tall. He weighs from 135 to 140 pounds, has brown eyes, is partly bald and wears horn-rimmed glasses. He wears a small moustache and acts nervous, it is said. Names he has used are "Dr." Marven Gordon Dietz, "Dr." Morgen Brooks and "Dr." Morris.

Society News.—Dr. Paul R. Cannon, Chicago, was elected chairman of the section on medical sciences (N) and a vice president of the American Association for the Advancement of Science at the recent meeting in Columbus.—Dr. Arthur E. Strauss, St. Louis, was installed as grand consul of Phi Delta Epsilon medical fraternity at the annual meeting in New York, December 30, succeeding Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL. Dr. Israel S. Zinberg, Baltimore, was elected grand consul-elect; Dr. Leo H. Crip, Pittsburgh, vice consul, and Dr. Benjamin Edgar Spiegel, New York, grand scribe.—Dr. William W. Wasson, Denver, was named president-elect of the Radiological Society of North America at its annual meeting in Atlanta, Ga., in December. Dr. Bernard H. Nichols, Cleveland, was installed as president. Vice presidents elected were Drs. Robert R. Newell, San Francisco; Rabun T. Wilson, Austin, Texas, and Leo G. Rigler, Minneapolis. Dr. Donald S. Childs, Syracuse, was reelected secretary.—The Women's Field Army of the American Society for the Control of Cancer held its second national assembly in Louisville, Ky., February 14-16.—Dr. Ruth E. Boynton, Minneapolis, was elected president of the American

Student Health Association at its recent annual meeting in New York. Dr. Fred N. Miller, Eugene, Ore., was elected vice president and Dr. Ralph I. Canuteson, Lawrence, Kan., secretary.

The Sixteenth Decennial Census.—The Bureau of the Census announces that the sixteenth decennial population census of the United States will be conducted in April by 120,000 enumerators. A force of 7,000 statisticians and clerks under the supervision of the bureau's permanent staff will tabulate the figures, making the results available in a short time, it is expected. This year's census will include questions designed to provide illuminating data on problems that have become particularly pressing in the last decade. New statistical knowledge will be developed on education, mass migration, employment, unemployment, occupation and income. There are thirty-three questions on the general population schedule. Of these the average person will have to answer not more than half, according to the announcement. Twenty of these are general questions relating to location, household data (number in family and kind of home), name, relationships, personal description, education, place of birth, citizenship and place of residence five years ago. This last question is designed to measure internal migration, such as movements from the dust bowl areas. The last thirteen questions in the general list concern employment and will be addressed to all persons over 14 years of age. A special group of questions will be asked of one in every twenty persons enumerated to provide the Census Bureau with a statistical sample to fill requests for information on special subjects. These questions are on the following subjects: place of birth of mother and father, mother tongue, veterans of military service, social security status, usual occupation (this is designed to determine how many persons are working outside their usual occupations) and women who are or have been married. Separate censuses are being made of business, manufactures and mines and quarries. These have been under way since January. Concurrent with the population census in April will be the censuses of housing, agriculture and irrigation and drainage.

Red Cross to Enroll Medical Technologists.—At the request of the surgeon general of the U. S. Army and in compliance with its policy of cooperation with the army and navy, the American Red Cross has undertaken the enrolment of various types of medical technologists who are willing to serve in the medical department of the army and navy if and when their services are required at the time of a national emergency. Persons with the following qualifications will be enrolled:

Chemical laboratory technicians (male).
Dental hygienists (male and female).
Dental mechanics (male).
Dietitians (male and female).
Laboratory technicians (male and female).
Meat and dairy hygienists (inspectors) (male).
Nurses (male).
Occupational therapy aides (male and female).
Orthopedic mechanics (male).
Pharmacists (male and female).
Physical therapy technicians (aides) (male and female).
Statistical clerks (male and female).
X-ray technicians (male and female).

Male nurses will not be members of the army or navy nurse corps, which under basic laws are limited to women, but will be used as technologists for service auxiliary to the regular corps. Male technologists will be eligible for enlistment in the army as noncommissioned officers in the grades of sergeant, staff sergeant or technical sergeant. Women technologists and men who do not qualify physically will be eligible for employment by the army as civilians. For the navy, male technologists will be eligible for enlistment in the naval reserve as petty officers—pharmacist's mates third, second and first class and chief pharmacist's mate (acting appointment). Women are not eligible for service in the navy, according to present plans. General qualifications for enrolment are as follows: citizens of the United States; ages 21-45 for the army and 18 to 35 (men only) for the navy; physically qualified; women must be unmarried; all must express willingness to serve as technologists in time of a national emergency. The medical department of the army will require a considerable number of technologists in all groups; the navy's requirements will be similar except that dietitians, occupational therapy aides, orthopedic mechanics and dairy and food hygienists (inspectors) will not be needed. The navy also desires peace time enlistment in the U. S. Naval Reserve, and male technologists who wish to enlist are urged to communicate directly with the commandant of the naval district in which they live. Technologists who qualify for this service and are willing to enroll should communicate with the American National Red Cross, Washington, D. C.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 26, 1940.

Ambulances for Finland

The admiration and sympathy for the Finns in their heroic stand against aggression is manifested in a practical form. We are doing what we can while engaged in a struggle of the same kind. A voluntary ambulance unit of the Women's Transport Service for work with the Finnish Red Cross is being sent. It consists of ten ambulances presented by the Canadian Red Cross, the British Red Cross and the officers of the Women's Transport Service. They are modeled on the lines of the British War Office type on a 24 horsepower eight cylinder Ford chassis and are internally heated. There is antifreeze mixture in the radiators, and a special paraffin burner is carried under the bonnet. The unit was inspected by the princess Alice in the presence of the Finnish minister and other foreign ministers and by the high commissioners for Canada and other dominions. The Finnish minister said that they would be an encouragement to the Finns in their struggle against tremendous odds. Care has been taken to equip the women of the unit against the rigors of the Finnish winter. They are equipped with men's woolen underclothing, of which they will wear two sets at a time. A second pair of heavy wool socks will be worn over the ski trousers.

Increase of Road Accidents Due to the Black Out

An increase of road accidents due to the darkness of the black out has been previously described. The number of deaths from this cause in December was 1,155, the highest in any month since records have been kept and an increase of 212 over December 1938. The highest previous record for one month was in September, the first month of the war, when 1,130 persons were killed. In October the figure fell to 919 and in November it was 926. The December 1939 figure included 820 pedestrians, the great majority of whom were killed during the black out. On very dark nights it is not uncommon for seven cases of fracture due to the black out to be brought into one London hospital. During the whole of 1939 the road deaths totaled 8,270 as compared with 6,599 in 1938. Of last year's total 849 were pedestrians under 15 years of age; 3,644 were pedestrians over 15; 1,064 were motorcyclists and 1,374 were pedal cyclists.

The National Safety First Association in an appeal for greater care on the roads emphasizes that the road deaths are now increasing at the rate of nearly 5,000 a year. Unnecessary use of the road at night should be avoided. Pedestrians who must be out should remember that their invisibility makes the danger and should protect themselves by wearing or carrying something white or luminous. So far the first four months of the war has increased the road deaths by 1,639 (66 per cent).

Improvement in the Health of Children

Sir Arthur Salusbury MacNalty, chief medical officer to the Board of Education, in his annual report said that for more than thirty years the school medical service has been actively promoting the health and welfare of school children. While we are far from perfection, school children of today in general health, physique and stature are much better than they were at the beginning of this period. During the year the nutrition of 1,674,023 children was assessed in routine medical inspection. In 14.5 per cent it was excellent, in 74.2 per cent normal, in 10.8 per cent slightly subnormal and in only 0.5 per cent bad. In many cases the local school authorities supply free meals or milk. The number of children receiving either of these was 687,855 in 1938-1939. In March 1939 the milk in schools scheme

was in operation in 86.9 per cent of all the departments of public elementary schools. The schools not operating it were mainly small rural ones containing less than 5 per cent of the children; 55.6 per cent of the children were taking milk under the scheme either free or on payment. On the advice of Professor Drummond some necessitous children were fed by the Oslo method and compared with others fed on the usual hot two course dinners. The "Oslo meal" consisted of salad (lettuce or, in winter, raw cabbage), tomatoes, cucumber, salad dressing, 1½ ounces of cheese, 3 ounces of brown bread, one-fourth ounce of butter, two thirds of a pint of milk and a raw apple or orange. The vegetables were made into a salad, and grated cheese was served on top. The children so fed showed a considerable advantage compared with controls. Many had not eaten brown bread before. The meal takes at least half as long again to consume as the two course hot dinner, as there is so much hard food to masticate.

COPENHAGEN

(From a Special Correspondent)

Jan. 16, 1940.

Preparations for Blood Transfusion in Wartime

With war looming near, the central committee of the Danish Medical Association has urged the nation to rally to the Danish Red Cross to help it realize its scheme for blood typing. Danish doctors have undertaken to make no charge for the taking of samples of blood for type determinations, and men and women exempt from military duties and between the ages of 18 and 60 have been urged to report to the nearest branch of the Danish Red Cross for information concerning blood donation. The State Serum Institute in Copenhagen has undertaken the necessary type determinations, a tremendous task.

The response to the appeal for donors for a wartime emergency has been so generous that in a short time over 29,000 persons answered it, and nearly 27,000 have passed the necessary tests and have been registered both at the headquarters of the Danish Red Cross and with the local branches to which they belong. In one district, Lolland, a special study has been made of the relative numbers of the different blood types. It was found that 38.7 per cent belonged to type O, 47.3 per cent to type A, 9.8 per cent to type B and only 4.2 per cent to type AB. The Danish army medical service is well satisfied with this ample reserve of donors, who, it is understood, will not be called on to shed their blood in any but a wartime emergency. For the emergencies of peace other arrangements are already in force.

The headquarters of the Danish Red Cross has been urged to devise a system for keeping the registers, central and local, constantly down to date, with special reference to the changes of the addresses of donors. In a recent issue of the *Ugeskrift for læger*, Dr. Erik Brammer pointed out how advantageous it might be for the prospective recipients of transfused blood if the rule was made of typing the blood of all persons whose blood is examined for some other purpose. In the course of time much valuable information would be obtained with regard to not only the donors but also the recipients of transfused blood.

The Declining Syphilis Rate

The decline of syphilis in Denmark is so marked from year to year that one might be tempted to anticipate its complete extinction in our own time but for the import of new infections from abroad. In 1930 there were 1,678 notifications of new cases of acquired syphilis (as distinct from congenital syphilis) of which 116 new cases were notified in this year; in 1938 only 470 new cases of acquired syphilis were notified, the number of new cases of congenital syphilis notified being down to fifty in this year. Between 1930 and 1938 the ratio of new cases of acquired syphilis per 10,000 inhabitants has diminished from 4.7 to 1.2. These most encouraging figures must, however,

be taken with due reserve. For it is often a ticklish matter to notice a case of venereal disease, and when one is in doubt it is easy to forget. It is therefore just as well that the efficacy of notification can be controlled from time to time by another system: the records of Wassermann reactions at the State Serum Institute, in which the Wassermann testing is centralized for the whole of Denmark. Dr. P. Krag and Dr. Marie Lindhardt have compared these two sources of information in a laborious study, which shows how defective the notifications of new cases of syphilis are likely to be, especially in a large city such as Copenhagen. Yet there can be no doubt as to the reality of the decline in the frequency of syphilis in the recent past.

Alcohol and Traffic Accidents

What most impresses the foreign visitor to Copenhagen is the prodigious number of its bicycles. In the busy hours of the day they are so thick on the pavement that crossing the street seems a physical impossibility. In 1937 Copenhagen could boast only 27,711 motorcars and only 6,752 motorcycles, whereas its bicycles number some 400,000. Little wonder therefore that bicycles and bicyclists figure prominently in traffic accidents. At the University Medico-Legal Institute, which is under Prof. Knud Sand, the calculation has recently been made that 45 per cent of all the deaths from traffic accidents between the ages of 11 and 60 in the period from 1926 to 1937 concerned bicyclists. The common assumption that in clashes between motorists and bicyclists the motorist is the aggressor is not always fair to him, and when attempts are made to apportion blame by means of blood and urine tests for alcohol, the testing ought to be extended to the bicyclist and even to the pedestrian involved in a fatal accident. This principle was put into force by the Copenhagen police between two and three years ago, the public hospitals being instructed to undertake alcohol tests of the blood and urine of all patients admitted for traffic accidents. Professor Sand and Dr. P. H. Andresen have found an alcoholic concentration of more than 0.1 per cent in the blood of 44 per cent of the 174 persons injured in traffic accidents during 1937 and up to August 1938. These persons were between the ages of 15 and 60. It does not say much for the sobriety of the average Dane in Copenhagen that almost every other person involved in some traffic accident has such a disconcertingly high concentration of alcohol in his blood.

SWITZERLAND

(From Our Regular Correspondent)

Dec. 26, 1939.

New School of Psychotherapy in Zurich

Under the direction of a board of trustees of psychiatrists and neurologists and at the suggestion of the Psychotherapeutic Commission of the Swiss Society of Psychiatry, a school of psychotherapy has been founded in Zurich. It means to give an opportunity for a thorough education especially to physicians and to induct practicing physicians into the scientific problems involved. The phenomena of psychoneurosis will be taught by means of lectures and practical demonstrations. The connection between the special problems of psychologic research and the verified facts of medicine and biology is to be maintained. The membership of the board consists, in part, of Dr. Binswanger, Dr. Forel, Prof. C. G. Jung and Dr. Hans W. Maier, professor of psychiatry, of Zurich.

Congress of Psychiatrists and Neurologists

The Swiss neurologic society and the society of Swiss psychiatrists held a joint meeting in Lugano under the presidency of Prof. John Stachelin, of Basel. The main subject of discussion was neuropathology and psychopathology of occupational poisoning on which Professors Flury, of Würzburg, Hans W. Maier, of Zurich, and H. Steck, of Lausanne, read papers. Dr. Lüthy, of Zurich, discussed peripheral nervous lesions in occupational poisoning.

Hereditary Feeble-mindedness in Switzerland

In Switzerland, as in other countries, the fertility of the normal population is surpassed by that of families with hereditary feeble-mindedness. Investigations in the city of Winterthur found that the families from which children came that attended special classes for backward pupils were larger than those of normal children (on the average 3.3) while the normal family groups had fallen to an average of 2.1 and 2.5, respectively. Dr. Brugger, school physician in Basel, genealogically examined the children of parents of 1,396 normal pupils and those of 427 hereditarily feeble-minded pupils and published his observations in a book on "Hereditary Diseases and Their Control." The investigation plainly shows that for several decades and at all economic levels, in Basel as well as elsewhere, on the average the families in which hereditary feeble-mindedness was found were larger than those of the normal group. This difference in fecundity, he said, must slowly but progressively lead to an increase of the feeble-minded unless the necessary eugenic control measures are promptly taken.

European Commission for Mental Hygiene

The European Commission for Mental Hygiene held its sixth meeting at the same time, and Switzerland, Belgium, Estonia, France, Germany, Great Britain, Italy, the Netherlands, Poland, Rumania, Sweden, Switzerland, Turkey and Yugoslavia were represented. The sessions were devoted to phases of the problem of mutual understanding.

Personals

Prof. Alfred Vogt, ophthalmologist in Zurich, celebrated his sixtieth birthday. The *Schweizerische medizinische Wochenschrift* honored him with a special dedication.

Prof. Eduard Glanzmann, director of the children's clinic of the University of Berne, was appointed to the professorship of pediatrics.

Prof. Max Askanazy, professor of pathologic anatomy at the University of Geneva, has reached the age limit and retired. His pupil Dr. Erwin Rutishauser was chosen as his successor.

Prof. Bruno Galli-Valerio, professor of hygiene and bacteriology at the University of Lausanne, retired after rounding out fifty years of teaching. Dr. Paul Hauduroy, director of the health department of Colombes, near Paris, was appointed as his successor.

Prof. W. Ruzicka, of Zurich, was awarded the Marcel Benoist prize for 1938 in recognition of his contributions in the field of the sex hormones and the polyterpenes.

Deaths

Dr. Oscar Bernhard, founder of heliotherapy in surgical conditions, died Nov. 16, 1939, in St. Moritz at the age of 78 years. He was a pioneer in the field of modern heliotherapy. He was highly esteemed at St. Moritz and had honorary degrees from the Universities of Berne and Frankfurt on the Main.

Dr. Alexander Tschirch, for many years professor of pharmacognosy and pharmaceutical chemistry at the University of Berne, died at the age of 84 years. Tschirch was born in Prussia and had established himself in Berne as early as 1890. Many of his contributions became well known, especially those on chlorophyll, resins and medicinal and useful plants. He was also the author of a large textbook on pharmacognosy.

Prof. Wilhelm von Speyr, for more than forty years (1890-1933) director of the asylum for mental diseases ("Waldau") in Berne and professor of psychiatry at the University of Berne, died at the age of 86 years. His main interest lay in the field of mental diseases caused by the use of alcohol. He was a firm believer in total abstinence.

Prof. Eugen Bleuler died in Zollikon, near Zurich, at the age of 83 years. His death closed a career rich in accomplishments. He became director of a large Swiss asylum when he was 29 years of age. Here he introduced a program of "work

therapy." He was one of the first leading psychiatrists to show an understanding of Freud's theories. In 1897 he was appointed director of the psychiatric clinic of the University of Zurich and for thirty years served in that capacity. His contributions were fundamental to the progress of psychiatry. His monograph on "Dementia Praecox," published in 1911, made him famous. His "Textbook on Psychiatry," published in 1918 and translated into different languages, gave fundamental expression to the psychologic trend in the study of this subject. In 1919 he published "Autistic-Undisciplined Medical Thinking and Its Cure," widely read and discussed also by others than psychiatrists and of great influence on medicine and psychiatric research. Bleuler had the genuine modesty of the really great scientist. He was an imposing, distinctive personality, a tireless worker and an excellent administrator and teacher.

Buenos Aires

(From Our Regular Correspondent)

Jan. 3, 1940.

The New Institute of Physical Research

In November 1939 the Instituto de investigaciones físicas aplicadas a la patología humana was dedicated in Buenos Aires. The new institute, of which Prof. M. Castex, professor of internal medicine, is the director, is closely connected with the Argentine Academy of Medicine. At the first meeting a series of lectures was given in Professor Castex's clinic by specially trained assistants. The subjects treated were the comparison of urobilinogen dosage by different methods, the spectrophotometric study of Ehrlich's diazo reaction, pleurophotography, allergic toxemia and a new respirator.

Conference on Alcoholism

The Liga Argentina contra el Alcoholismo recently held its second session on alcoholism, which lasted four days. It was well attended and engaged the interest of the country's physicians to a considerable degree. Prof. A. H. Roffo and Dr. Gonzalo Bosch, members of the faculty of medicine, presided. Dr. Pablo J. O. Wolff spoke on the dangers of the cocktail, Dr. Luis L. Boffi on the relations between tuberculosis and alcoholism, Dr. C. N. de Fischer on alcoholism and its effects on the child, Dr. M. T. F. de Guadino on alcoholism in women, Dr. A. R. Rossi on alcoholism as a social disease, Dr. D. Madanes on the legal bases for the fight against alcoholism and Dr. J. L. Pavia on the harmful effects of alcohol on visual acuity.

Combating Hydatidosis

The Asociación Médica Argentina in a recent joint meeting with the veterinary society discussed the national problem of hydatidosis. Francisco Rosenbusch, professor of veterinary parasitology, said that in some sections of Argentina more than 50 per cent of the live stock was infested with hydatid cysts and that the farmers of these areas had no conception of the dangers inherent in hydatidosis for human beings. Medical opinion emphasized the need of extensive educational publicity and of laws against hydatidosis. A national commission was organized in Argentina for combating hydatidosis. The necessity of such a fight is discernible from the facts disclosed by the veterinary José R. Serres that Argentina, Iceland, Australia, New Zealand and Uruguay are the principal countries afflicted with these parasites. The president of the republic of Uruguay in a recent message called attention to this problem. The Sociedad de Biología in Concepción, Chile, recently directed attention to the frequency of the disease in that city.

Commemoration of First Blood Transfusions with Sodium Citrate

Until 1914 blood transfusions were attended with many difficulties, since no method was known to prevent coagulation. The method perhaps mostly employed was that of Crile, consisting in

the establishment of a direct anastomosis of the arteries of the donor and the receiver. In November 1914, during the first months of the World War, Prof. Luis Agote discovered that sodium citrate would prevent blood coagulation. He recognized at once the practical significance of his discovery and on November 9 performed the first transfusions in the presence of numerous physicians. The first press item of the discovery appeared in the New York *Herald* of November 14 and a further item on the following day. On November 22 the department of the exterior of Argentina made known the new method with the technical details to the diplomatic representatives of the belligerent countries stationed in Buenos Aires; that is, of Belgium, France, Germany, Great Britain, Russia and Turkey, a humane discovery in inhumane days. Two commemorative meetings were held in Buenos Aires in honor of the discovery and its discoverer.

The Academy of Surgery in Buenos Aires

The Society of Surgeons passed a resolution on the occasion of its twenty-fifth anniversary to convert the society into an academy. Now, three years later, the change has been made. The new Academy of Surgeons had its first meeting at the end of November 1939 with Prof. Rodríguez Villegas in the chair and was formally organized on December 20. The regular members of the former society constitute the membership of the new academy.

Personals

In November 1939 Juan R. Goyena, professor of internal medicine in Buenos Aires, celebrated his twenty-fifth anniversary as a teacher. Commemorative exercises were held. Goyena's field is principally that of gastric and intestinal disorders. He was chairman of the society for gastro-enterology, co-founder of the international society of the same name in Brussels and president of the Asociación Médica Argentina.

Dr. Gregorio Aráoz Alfaro, for twenty-five years president of the Argentine League against Tuberculosis, has resigned. The league, founded in 1901, now maintains two dispensaries with branches and owns a large building and two preventorios for children in rural districts. A large sanatorium is in process of construction.

Deaths

Prof. Francisco Llobet, professor of surgery in Buenos Aires, died in retirement on Nov. 2, 1939. Prof. Bernardino Maraini, until recently professor of clinical urology in Buenos Aires, died November 10. Both were esteemed as clinicians.

Marriages

NORBORNE BERKELEY POWELL, Dallas, Texas, to Miss Elizabeth Mary Balas of McKeesport, Pa., Dec. 18, 1939.

GEORGE V. LAUNEY JR., Fort Worth, Texas, to Miss Harriet Louise Pitts of Alexandria, La., January 6.

HUB E. ISAACKS, Fort Worth, Texas, to Mrs. Irene Lee Tomlinson, of Houston, January 15.

WILLIAM L. COLE, Evansville, Ind., to Miss Barbara Louise Bagley, of St. Louis, Nov. 23, 1939.

GEORGE L. KRAFT, Chicago, to Miss Alleen Hoffland, of Soldiers Grove, Wis., February 7.

KENNETH I. SHEEK, Greenwood, Ind., to Miss Mary Thompson, of Indianapolis, Dec. 2, 1939.

TIM JOSEPH MANSON, Chattanooga, Tenn., to Miss Helen Taylor at Knoxville in February.

JOSEPH H. BALTES to Miss Margaret I. Walsh, both of Fort Wayne, Ind., Nov. 23, 1939.

HERSCHEL C. CRAWFORD to Mrs. Nellie Lafayette Kelly, both of Atlanta, Ga., February 8.

JOHN B. OGILVIE to Miss Ann Bassett Jones, both of New York, February 2.

Deaths

DEATHS

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- David Murray Cowie** * Ann Arbor, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896; professor of pediatrics and infectious diseases and chairman of the department at his alma mater since 1920, assistant professor of the theory and practice of medicine from 1896 to 1899, first assistant in internal medicine from 1899 to 1906, instructor of pediatrics, 1906-1907, clinical professor of internal medicine from 1909 to 1919 and professor of pediatrics and internal medicine, 1919-1920; secretary of the University of Michigan Pediatrics and Infectious Disease Society; member of the American Pediatric Society; member of the Society of Pediatrics, International League Against Epilepsy, American Society of Clinical Investigation (vice president 1920-1921) and fellow of the American College of Pathologists and Bacteriologists; and owner of a hospital bearing his name; associate editor of the *American Journal of Diseases of Children* from 1912 to 1924; aged 67; died, January 27, of coronary thrombosis.
- George Shattuck Whiteside** * Pine Orchard, Conn.; Harvard Medical School, Boston, 1897; fellow of the American College of Surgeons; past president and secretary of the Portland (Ore.) City and County Medical Society; assistant in later assistant professor of surgery, University of Oregon Medical School, Portland, from 1904 to 1916; served during the World War; at one time surgeon to the Multnomah Hospital, Portland; on the staff of the Greenpoint Hospital, Brooklyn, from 1932 to 1938; aged 66; died, January 29, in New York, of heart disease.
- Webb William Weeks** * New York; Columbia University College of Physicians and Surgeons, New York, 1912; professor of ophthalmology at the New York University College of Medicine; member of the American Academy of Ophthalmology and Otolaryngology and the American Academy of Ophthalmology; fellow of the American College of Surgeons; served during the World War; surgeon to the New York Eye and Ear Infirmary; visiting surgeon, department of ophthalmology, Bellevue Hospital; aged 53; died, January 10.
- Joseph Forrest Burnham** * Lawrence, Mass.; Harvard Medical School, Boston, 1901; member of the House of Delegates of the American Medical Association in 1915 and from 1920 to 1936; served during the World War; member and secretary of the staff of the Lawrence General Hospital; formerly of the Essex North District Medical Society; aged 70; died, January 26, in the Phillips House of the Massachusetts General Hospital, Boston, of carcinoma of the prostate.
- Alexander Crump Kirby** * Little Rock, Ark.; Washington University School of Medicine, St. Louis, 1917; assistant professor of pediatrics at the University of Arkansas School of Medicine; served during the World War; formerly member of an advisory council of the maternal and child health division, and consultant to the state board of health; aged 47; died, Nov. 4, 1939.
- Henry Lawrence Swain** * New Haven, Conn.; Yale University School of Medicine, New Haven, 1884; clinical professor of otology emeritus at his alma mater; member, past president and secretary of the American Laryngological Association; laryngologist to the New Haven Dispensary and Hospital; aged 75; died, January 11, of esophageal varix and cirrhosis of the liver.
- Thomas Le Roy Lauderdale** * Ranger, Texas; University of Oklahoma School of Medicine, Oklahoma City, 1913; fellow of the American College of Surgeons; past president of the Eastland County Medical Society; served during the World War; a medical director of the West Texas Clinic and Hospital; aged 50; died, January 1, of pulmonary tuberculosis.
- Kimball Bannister**, Phoenix, Ariz.; Northwestern University Medical School, Chicago, 1914; member of the Arizona State Medical Association; fellow of the American College of Surgeons; on the staffs of St. Joseph's and Good Samaritan hospitals; aged 50; died, January 30, of injuries received in an automobile accident.
- George Alexander Van Wagenen**, St. Petersburg, Fla.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1871; for many years medical director of the Mutual Benefit Life Insurance Company; aged 94; died, January 2, of pyelonephritis and chronic myocarditis.
- Jesus Maria Armaiz** * Vega Baja, P. R.; Hahnemann Medical College and Hospital of Philadelphia, 1911; formerly vice president of the Puerto Rico Medical Association; medical superintendent of a hospital bearing his name; aged 52; died, Dec. 23, 1939, in Santurce of typhoid and bronchopneumonia.
- Walker Washington** * Staten Island, N. Y.; Bellevue Hospital Medical College, New York, 1885; past president of the Richmond County Medical Society; for many years president of a bank in Tottenville; on the staff of the Richmond Memorial Hospital; aged 79; died, Dec. 10, 1939.
- Thomas Joseph Perkins**, Baton Rouge, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1892; member of the Louisiana State Medical Society; formerly superintendent of the East Louisiana State Hospital, Jackson; aged 70; died, Dec. 30, 1939, of heart disease.
- James D. Jordan**, Portsmouth, Ohio; University of Louisville (Ky.) Medical Department, 1894; member of the Ohio State Medical Association; on the staff of the Portsmouth General Hospital; aged 69; died, January 2, in a hospital at Dalton, Ga., of injuries received in an automobile accident.
- Isidore J. Weida**, Emmaus, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; for many years member of the board of health; aged 73; died, Dec. 23, 1939, of hypertension and coronary disease.
- George Lawrence McCormick** * Beaver Falls, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1907; on the staffs of the Providence Hospital, Beaver Falls, and the Beaver Valley General Hospital, New Brighton; aged 59; died, Dec. 31, 1939, of coronary occlusion.
- Wilkes H. Knolle**, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1891; member and past president of the Louisiana State Medical Society; president of the Orleans Parish Medical Society; aged 69; died, January 7, of coronary thrombosis.
- Carl Ralph Martin**, Fountain City, Tenn.; Chattanooga (Tenn.) Medical College, 1910; member of the Tennessee State Medical Association; served during the World War; formerly bank president, aged 58; died, January 8, in St. Mary's Hospital, Knoxville, of bronchopneumonia.
- Claude Terrell Poole**, St. Pauls, N. C.; North Carolina Medical College, Charlotte, 1907; member of the Medical Society of the State of North Carolina; served during the World War; aged 53; died, January 8, in the Veterans Administration Facility, Columbia, S. C.
- Carl Welfey Frantz** * Confluence, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1907; formerly bank president; owner and medical director of a hospital bearing his name; aged 55; died, Dec. 20, 1939, of carcinoma of the prostate with metastases.
- Robert Henry Beverly**, Springfield, Ill.; Bennett Medical College, Chicago, 1912; member of the Illinois State Medical Society; state district health superintendent for the state department of health; aged 61; died, January 22, in St. John's Hospital.
- John Baker Haggard**, Fort Leavenworth, Kan.; University of Tennessee Medical Department, Nashville, 1892; served during the World War; aged 71; died, January 9, in the Veterans Administration Facility, Wadsworth, of arteriosclerotic heart disease.
- Benjamin A. Gipple**, Alden, N. Y.; University of Buffalo School of Medicine, 1894; member of the Medical Society of the State of New York; for many years health officer; aged 74; died, Dec. 30, 1939, of coronary embolism and cerebral thrombosis.
- Jefferson Duddlestone Blything**, Fontana, Calif.; Rush Medical College, Chicago, 1906; at one time city physician of Davenport, Iowa; aged 63; died, Dec. 2, 1939, in the Veterans Administration Facility, West Los Angeles, of brain tumor.
- Thomas Brown Johnson** * Indianapolis; University of Maryland School of Medicine, Baltimore, 1906; served during the World War; for many years on the staff of the Veterans Hospital; aged 57; died, January 6, of coronary thrombosis.
- Theodore Marion Du Bose Sr.**, Columbia, S. C., Medical College of the State of South Carolina, Charleston, 1881; member of the South Carolina Medical Association; aged 81; died, Dec. 25, 1939, of myocarditis and arteriosclerosis.
- Joseph Henry Hauck**, Terre Haute, Ind.; Eclectic Medical Institute, Cincinnati, 1899; member of the Indiana State Medical Association; served during the World War; aged 65; died, January 4, in the Union Hospital, of diabetes mellitus.

Bernard Bertram Wormser ☉ Scranton, Pa.; Jefferson Medical College of Philadelphia, 1902; served during the World War; on the staffs of the Scranton State and Hahnemann hospitals; aged 62; died, Dec. 28, 1939, of heart disease.

William H. Ditmars, Jonesville, Mich.; Detroit College of Medicine, 1896; member of the Michigan State Medical Society; president of the school board; aged 66; died, January 3, in the Hillsdale (Mich.) Hospital of cerebral hemorrhage.

Thomas Walker Tait, Philadelphia; Jefferson Medical College of Philadelphia, 1888; formerly on the staffs of the Methodist Hospital and St. Agnes Hospital; aged 76; died, Dec. 13, 1939, of granulocytopenia and peritonsillar abscess.

Charles Elliott Ristine, Knoxville, Tenn.; University of Pennsylvania Department of Medicine, Philadelphia, 1870; member of the Tennessee State Medical Association; Civil War veteran; aged 94; died, January 10, of pneumonia.

Frederick Edwin Tully, San Diego, Calif.; Marion-Sims College of Medicine, St. Louis, 1895; member of the California Medical Association; served during the World War; aged 71; died, Dec. 6, 1939, of coronary disease.

Elias H. Witmer, Lancaster, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1877; member of the Medical Society of the State of Pennsylvania; aged 86; died, Dec. 13, 1939, of arteriosclerosis.

Robert Lee Hardwick, Mount Vernon, Ind.; Missouri Medical College, St. Louis, 1886; for many years county health officer; aged 76; died, January 5, of cerebral hemorrhage and carcinoma of the colon.

Ernest Darnall, Colt, Ark.; Memphis (Tenn.) Hospital Medical College, 1908; member of the Arkansas Medical Society; aged 56; died, January 2, in the Baptist Hospital, Memphis, of cerebral hemorrhage.

Julian Lloyd Waller, San Francisco; College of Physicians and Surgeons of San Francisco, 1904; member of the California Medical Association; served during the World War; aged 69; died, Nov. 15, 1939.

Napoleon Landry, Fitchburg, Mass.; School of Medicine and Surgery of Montreal, Que., Canada, 1893; aged 79; died, Dec. 21, 1939, in Lunenburg, of cerebral hemorrhage and arteriosclerosis.

James West Hingston, Chicago; Hahnemann Medical College and Hospital, Chicago, 1882; aged 81; died, January 29, in the West Suburban Hospital, Oak Park, Ill., of hypertrophy of the prostate.

Nathan Caldwell Doane, New Market, Tenn.; Tennessee Medical College, Knoxville, 1894; on the staff of the Jefferson Hospital, Jefferson City; aged 73; died, January 8, of coronary occlusion.

John P. Hawkins, Anniston, Ala.; Chattanooga (Tenn.) Medical College, 1894; member of the Medical Association of the State of Alabama; aged 70; died, January 1, of angina pectoris.

Solomon Wells Churchill, New York; Bellevue Hospital Medical College, New York, 1897; aged 80; died, January 15, in St. Luke's Hospital of cerebral hemorrhage and bronchopneumonia.

Claude E. Earle, Anderson, S. C.; College of Physicians and Surgeons, Baltimore, 1886; aged 79; died, Dec. 23, 1939, in the Anderson County Hospital of carcinoma of the prostate.

Milton H. Brown, Morgantown, W. Va.; Baltimore Medical College, 1893; member of the West Virginia State Medical Association; aged 71; died, January 10, of coronary thrombosis.

James Ernest Brooks, Chicago; Bennett Medical College, Chicago, 1910; member of the Illinois State Medical Society; aged 56; died, January 4, of arteriosclerosis and chronic nephritis.

Luther James Shepley, North Westport, Mass.; College of Physicians and Surgeons, Boston, 1902; served during the World War; aged 63; died, Dec. 19, 1939, of coronary occlusion.

David Thomas Bailey, Cleveland; University of Wooster Medical Department, Cleveland, 1900; aged 65; died, January 21, in the Cleveland-Clinic Hospital of carcinoma of the pancreas.

George Abner Hammond, Dothan, Ala.; Baltimore Medical College, 1884; member of the Medical Association of the State of Alabama; aged 80; died, January 4, of chronic myocarditis.

William Thomas Joiner, Pittsview, Ala.; Atlanta Medical College, 1891; aged 80; died, January 8, in the City Hospital, Columbus, Ga., of uremia and hypertrophy of the prostate.

George Monroe Hite, Amelia, Ohio; Eclectic Medical College, Cincinnati, 1918; member of the Ohio State Medical Association; aged 50; died, January 20, of heart disease.

Edward L. Wilkinson, Jacksonville, Fla.; College of Physicians and Surgeons, Baltimore, 1885; aged 79; died, Nov. 6, 1939, in St. Luke's Hospital of mesenteric thrombosis.

Thomas N. Ellis, Knoxville, Tenn.; Kansas City (Mo.) Hospital College of Medicine, 1885; aged 79; died, January 3, of myocarditis, chronic nephritis and hypertension.

Benjamin Augustus Crichlow, Charleston, W. Va.; Howard University College of Medicine, Washington, D. C., 1902; aged 66; died, Dec. 31, 1939, of gastric ulcer.

Welcome Turner Jones, Little Rock, Ark.; Western Reserve University Medical Department, Cleveland, 1893; aged 74; died, January 12, of mitral insufficiency.

Alfred G. Shissler, Shamokin, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1889; aged 73; died, Dec. 9, 1939, of carcinoma of the lung.

Herman M. Doty, Chagrin Falls, Ohio; Western Reserve University Medical Department, Cleveland, 1873; aged 91; died, Dec. 29, 1939, of bronchopneumonia.

Louise Patterson, Glendale, Calif.; American Medical Missionary College, Chicago, 1899; aged 73; died, Nov. 17, 1939, of arteriosclerosis and myocarditis.

Llewellyn Fleet Luckett ☉ Washington, D. C.; Columbian University Medical Department, Washington, 1895; aged 68; died, Dec. 31, 1939, of heart disease.

William Eric A. D. Von Der Goltz, New York; Universität Basel Medizinische Fakultät, Switzerland, 1887; aged 77; died, Dec. 17, 1939, of heart disease.

Thomas Moore Acken ☉ New York; University of the City of New York Medical Department, 1893; aged 72; died, Dec. 11, 1939, of cerebral hemorrhage.

Maude Waterhouse Abbott, Canton, Ohio; Eclectic Medical Institute, Cincinnati, 1886; aged 79; died, January 2, of cerebral hemorrhage and arteriosclerosis.

Tandy Bartow Harrison, Charleston, Miss.; Memphis (Tenn.) Hospital Medical College, 1892; aged 77; died, Dec. 31, 1939, of cirrhosis of the liver.

Max Grossman, Brooklyn; Long Island College Hospital, Brooklyn, 1902; aged 58; died, January 5, in the Kings County Hospital of intestinal obstruction.

Catharine Phoebe Hayden, Ashland, Mass.; University of Colorado School of Medicine, Denver, 1894; aged 81; died, Dec. 26, 1939, of arteriosclerosis.

Franklin Noll, Jenkintown, Pa.; Jefferson Medical College of Philadelphia, 1892; aged 67; died, Dec. 16, 1939, of encephalomalacia and bronchopneumonia.

George Estus Garwood, Toledo, Ohio; Toledo Medical College, 1900; served during the World War; aged 75; died, January 5, of paralysis agitans.

Benjamin Iverson Hicks, Vicksburg, Miss.; Louisville (Ky.) Medical College, 1896; aged 68; died, January 16, of uremia and heart disease.

Albert F. Snell, Cleveland (licensed in Tennessee in 1899 and in Ohio in 1897); aged 83; died, Dec. 27, 1939, of arteriosclerotic heart disease.

William F. Birss, Grand Rapids, Mich.; Saginaw Valley Medical College, Saginaw, 1902; aged 61; died, January 13, of coronary thrombosis.

Charles Wesley Davis, Cincinnati; Medical College of Ohio, Cincinnati, 1887; also a druggist; aged 77; died, Dec. 2, 1939, of myocarditis.

James Joseph McMahon ☉ Port Allegany, Pa.; Jefferson Medical College of Philadelphia, 1927; aged 40, died, Dec. 9, 1939, of heart block.

James Whitworth, Clarksville, Tenn.; University of Nashville Medical Department, 1898; aged 63; died, Nov. 25, 1939, of angina pectoris.

Charles Damsky ☉ Lynn, Mass.; Middlesex College of Medicine and Surgery, Waltham, 1921; aged 45; died, Dec. 3, 1939, in Boston.

Robert Kirksey, Pickens, S. C.; College of Physicians and Surgeons, Baltimore, 1891; aged 71; died, Dec. 29, 1939, of pneumonia.

Clark Kirksey Thomas, Findley, Ohio; Toledo Medical College, 1897; aged 75; died, Dec. 25, 1939, of acute dilatation of the heart.

Martin L. Sellers, Los Angeles; Barnes Medical College, St. Louis, 1899; aged 69; died, Nov. 24, 1939, of coronary sclerosis.

BUREAU OF INVESTIGATION

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Bureau of Investigation

THE BAKER HOSPITAL AND
J. L. STATLER, M.D.

In the story of Norman Baker, recently published in these pages, frequent reference was made to the Baker Hospital. It was noted that J. L. Statler, M.D., was one of those sentenced along with Norman Baker. The article contained many excerpts from Baker's biography, "The Throttle." However many significant events occurred in Baker's life prior to the publication of "The Throttle" which the biographer neglected to mention.

At the time of Baker's historic announcement in December 1929 that "Cancer Is Conquered," he opened the Baker Institute at Muscatine for the treatment of cancer, tumors, goiters, prostate gland troubles, stomach ulcers, rheumatism, gallstones and diabetes. Although neither Baker nor any of the persons associated with him in the enterprise had been licensed to practice medicine in Iowa, several physicians were employed by him at different times, apparently not for the purpose of treating or directing the treatment of patients but ostensibly for the purpose of making diagnoses. Each prospective patient was examined by a licensed physician so employed, who wrote his observations on a blank diagnosis chart containing, among other things, a statement of the nature, character and location of the disease from which the patient was alleged to be suffering. The charts did not contain specific directions as to the medicine or treatment to be administered. Attached to each diagnosis chart was a treatment card which seemed almost invariably to be signed in blank by a Dr. Bair at the request of Baker.

Apparently the sole medicines used, regardless of the so-called diagnosis, were a liquid mixture the formula of which was at that time known only to Baker and a powder the formula of which was at that time known only to Baker's associate, Hoxsey. Later the treatment cards were filled in by some person other than Dr. Bair. This procedure did not fool the Iowa courts. The Supreme Court of Iowa on Feb. 11, 1931, held that Baker, notwithstanding the elaborate screen he had attempted to interpose to hide his actual activities, was practicing medicine in violation of the law, and it enjoined him from practicing medicine (*State v. Baker*, 235 N. W. 313). Baker then made many attempts to reframe his corporate structure and developed devious business enterprises to evade this injunction. He tried and he failed!

The Supreme Court then found it necessary to adopt waiting tactics in order to call him to account for his flagrant violation of its injunction. Finally the law prevailed, and on Dec. 15, 1936 (*State v. Baker*, 270 N. W. 359), held Baker in contempt of court and imposed on him the maximum penalty. This the court frankly stated was "wholly inadequate"—a \$50 fine and one day in jail. The Supreme Court used this enlightening language with respect to Baker's attempt to evade this injunction:

"This defendant and accomplices and confederates in the operation of the Baker Hospital at Muscatine, Iowa, were engaged in perpetrating a stupendous fraud against the court. We cannot shut our eyes to such transparent trickery. A court so supine as to overlook such conduct would merit the contempt of all fair-minded men."

While the author of "The Throttle" may have omitted reference to these proceedings on the plea that the relative unimportance was reflected in the lightness of the fine, the incidents "throttled" Baker, so far as Iowa was concerned. As noted in the previous report, Baker moved the Muscatine Baker Hospital, lock, stock and barrel, to his already established hospital at Eureka Springs, Ark.

In connection with the case last referred to above (*State v. Baker*, 270 N. W. 359) it was brought out that Baker had attempted through the fiction of a lease of the Baker Hospital to Dr. J. L. Statler and others to circumvent the injunction. It would seem to follow that since the Supreme Court of Iowa denominated Baker's attempt to evade the injunction as a fraud on the court, those who aided Baker in doing so—and Statler was one of those persons—were likewise guilty of perpetrating a fraud on the court. It would likewise seem to follow that Statler in attempting to circumvent the injunction also prostituted his professional reputation in furthering the Baker Institute and in associating himself with Baker in his activities.

According to the available records, Johnson Lewis Statler was born in Sedgewickville, Mo., in 1883 and was graduated from Barnes Medical College, St. Louis, in 1909. He was licensed in Missouri that same year, in Oklahoma in 1910 and in Iowa in 1916, in both states by reciprocity with Missouri.

In an article in *THE JOURNAL* for July 31, 1937, it was noted that the application of Statler, doing business as the Baker Hospital, Muscatine, Iowa, for authority to transmit programs to stations in Canada and Mexico was denied by the Federal Communications Commission. It was noted that he was a long-time associate of Norman Baker and lessee of the Baker Hospital. The Federal Communications Commission, in denying the Statler application to maintain a radio broadcast studio at Muscatine for the purpose of making transcriptions to be transmitted to stations in Canada and Mexico, was constrained to find that the applicant (Statler) was not the real party in interest in the case. According to the Federal Communications Commission's report of the hearing, "the only evidence offered by applicant with respect to a need for the proposed service related to the falling off of business of the Baker Hospital when KTNT was deleted . . . It is our opinion that the applicant has failed to show that the program service proposed to be rendered [advertising the Baker Hospital] would be in the public interest."

According to a news item appearing in the *Chicago Tribune* for Feb. 28, 1932, and referring to some of the facts brought out in Baker's suit against the A. M. A., "Statler, whom former employees had identified as the leading diagnostician of the institute, admitted to Judge G. N. Nordbye that he could not explain how the Baker 'cure' was supposed to seek out and destroy cancerous cells."

As a matter of fact, he not only did not know how it worked but he knew that it did not work in a great many cases. Previously he had signed hundreds of death certificates of persons who had died at the Baker Institute at Muscatine, Iowa. Selecting the cause of death from a few such certificates chosen at random, one finds "recurrent cancer of breast," "sarcoma of liver," "cancer of stomach," "cancer of left breast," "sarcoma of the thyroid," "cancer of cervical stump," "sarcoma of stomach," "cancer of the neck," "cancer of rectum and stomach" in individuals from Illinois, Iowa, Alberta, North Dakota, Michigan and Wisconsin. At this time and subsequently Statler was cooperating with Baker in promoting Baker's claim that cancer was curable.

Things did not always go well with Statler, however. The Davenport (Iowa) *Democrat* reported on Oct. 23, 1933, that he had filed a bankruptcy petition in the federal district court at Davenport, with debts of over \$9,000, \$7,500 of which represented three judgments obtained against him in Van Buren County. Furthermore, Baker and Statler did not always hit it off well; reference to the May 18, 1932, issue of the same newspaper indicated that N. G. Baker and the Baker Investment Company were plaintiffs in two replevin actions filed in an effort to gain possession of the Baker Hospital, and that Dr. J. L. Statler was named defendant in one case and J. L. Statler and Rennie A. Bellows were joint defendants in the other action. Baker's action against Statler was subsequently dismissed.

It is apparent that Statler later smoothed over his difficulties with Baker for the two of them are next found working hand in glove in the operation of Baker's hospital in Eureka Springs, Ark. As a result of this reconciliation Statler now faces the prospect of lodging and meals at Uncle Sam's expense for one year and one day.

When an individual who is totally devoid of any scientific training, let alone any formal medical education, attempts to treat patients who are suffering from a serious disease, he must comply with certain regulations—or at least make a pretense of complying with such regulations. The usual technic is to associate with him some one who does hold a license to practice medicine. Baker was eventually stopped in Iowa. The pretext which he used in trying to avoid difficulty with the law by leasing his hospital to Statler was not sufficient to save the law by tution. Obviously Baker could not have gained much headway if he had not had associated with him a man who was licensed to practice, a man who could legally place after his name the initials "M.D." What price was paid to Statler for supporting the ideas and carrying out the work in the Baker Hospital is not known, but it certainly should have been a goodly sum, for

Statler, by joining Baker, made himself a pariah in his chosen profession. At least temporarily he is, of course, not practicing medicine; so far as the Bureau can determine, he is now behind bars pending any subsequent arrangements that may be made in connection with his sentence, which, as it will be recalled, was one year and one day in jail.

Here, then, is a man—recognized as a physician—whose cooperation was necessary to perpetrate the Baker fraud. Although graduating from a reputable medical school, he abused his right and privilege to practice medicine. Once, no doubt, he listened to the high precepts and ideals which are impressed on the student of medicine. Could he have thought of them as he signed death certificates for those who died in the Baker Hospital? Does he ponder on the past as he sits in jail awaiting developments in a case in which he was found guilty of fraud? It is a pitiful spectacle—a man fully qualified, both by medical training and by legal recognition of that medical training, to become an important factor in the life of any community in which he settled finds himself instead behind bars, after having signed hundreds of death certificates for persons who were told that their cancers would be cured. There is a lesson in the life of this charlatan that every student in our medical schools today should learn.

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Fisher's Diuretic Alternative.—Mrs. E. Heinz, Denver. Composition: Chiefly water, alcohol, sugar and small amounts of plant material extracts. Fraudulently claimed to cure dropsy and skin diseases, dissolve gallstones, strengthen the nerves, etc.—[N. J. 30223; June 1939.]

Fisher's Gastric Assimilator.—Mrs. E. Heinz, Denver. Composition: Alcohol, water and plant material extracts. Fraudulently represented for chronic stomach disorders, pain of childbirth, etc.—[N. J. 30223; June 1939.]

Fisher's P P P.—Mrs. E. Heinz, Denver. Composition: Essentially water, alcohol, epsom salt and flavoring. Fraudulently represented as "an emergency remedy" for conditions not named.—[N. J. 30223; June 1939.]

G. S. I. Gly-So-Iodonate.—National Medical Research Laboratories, Milwaukee. Composition: Essentially water, alcohol, glycerin, common salt and small quantities of carbonates, sulfates, iodides, phosphates and borates, with traces of formaldehyde and iodoform. Adulterated because its strength fell below the professed quality or standard under which it was sold, namely, an antiseptic. Misbranded because representations made for it as an "antiseptic surgical first aid" and as a remedy for burns on scalp and skin were fraudulent.—[N. J. 30220; June 1939.]

Miller's (Dr.) Intraclean.—Miller Co., Inc., Newark, N. J. Composition: Essentially broken senna leaves and buckthorn bark, with a small amount of agar agar. For nervousness, stomach, kidney and liver disorders, obesity, high blood pressure, backache, etc.—[N. J. 30224; June 1939.]

Mother Hubbard Camphorated Oil.—Mother Hubbard Products Co., Inc., Chicago. Composition: Not more than 10.6 per cent of camphor. Adulterated because it did not contain 19 per cent of camphor as required for camphorated oil by the U. S. Pharmacopeia, and misbranded because fraudulently represented as an effective treatment for asthma and croup.—[N. J. 30025; May 1939.]

Mother Hubbard Remedies Laxative Head-Cold Tablets.—Mother Hubbard Products Co., Inc., Chicago. Composition: Not more than 0.913 grains of acetanilid per tablet. Adulterated because not containing the 2 grains of acetanilid per tablet declared on the package, and misbranded because claimed to contain no "harmful habit-forming drugs," whereas they did contain acetanilid.—[N. J. 30025; May 1939.]

Orcholone Tablets.—Hudson Pharmacal Co., Inc., Union City, N. J. Composition: Animal tissue, probably glandular in nature, with $\frac{1}{2}$ grain of extract of nux vomica per tablet. Adulterated because not containing active principles of testicular glands as represented, and misbranded because fraudulently represented to cure nervous exhaustion, sexual apathy and "subefficiency" in men.—[N. J. 30222; June 1939.]

Tensol.—Tensel Co., Elmira, N. Y. Composition: An aqueous solution of a mild silver proteinate compound. Fraudulently represented to cure tonsil disorders, diphtheria, quinsy, adenoids, etc.—[N. J. 30225; June 1939.]

Correspondence

"PRIMARY TUBERCULOUS INFECTION ATTACK RATES"

To the Editor:—In the Dec. 16, 1939, issue of THE JOURNAL, page 2204, Stewart and his associates published a paper on "Primary Tuberculous Infection Attack Rates." Among the group studied were nurses training in (1) a general hospital with no tuberculosis service, (2) a general hospital with a six weeks tuberculosis service, which I shall designate as hospital A, (3) a general hospital with a three months tuberculosis service, which I shall designate as hospital B, and (4) a six weeks service in a tuberculosis sanatorium and the hospital where the nurses receive the remainder of their three years training, which will be designated as C.

The report attempts to compare the infection rate obtained from the six weeks service in a tuberculosis sanatorium with the three year infection rate in the two general hospitals which have a tuberculosis service. This is manifestly an unscientific and unfair comparison.

According to one of the collaborators (Boynton, Ruth E.: Incidence of Tuberculous Infection in Student Nurses, *Am. Rev. Tuberc.* 39:671 [May] 1939), 29.9 per cent of the student nurses entering the training school at hospital C during the years 1933 to 1937 were tuberculin positive at the beginning of their hospital experience, and during the first year 17.9 per cent of those who were tuberculin negative became tuberculin positive, even though they had not yet had their tuberculosis service. In a personal communication, Boynton informed me that 60.9 per cent of the nurses who entered the training school at hospital C were tuberculin positive at the end of their training. This includes six weeks in a tuberculosis sanatorium.

Her report of the percentage of nurses who were tuberculin positive at the beginning and end of training means that seventy of each hundred nurses were tuberculin negative at the beginning of training while only thirty-nine were tuberculin negative at the end of training. The difference between the seventy and the thirty-nine is thirty-one. This represents the number of negative nurses out of each hundred who became infected during their three year training period. This is 43 per cent of the original negative group of seventy. Dividing that by 3, representing the number of years spent in training, as was done for hospitals A and B, one finds that hospital C has an average annual increase in infection of 14.3 per cent in contrast to 19.8 per cent for hospital A and 29.7 per cent for hospital B. When the six weeks contact at the sanatorium is considered by itself, the authors place "the crude annual primary infection attack rate" at 115.4 per cent instead of at 14.3 per cent. This is arrived at by multiplying ten weeks, the time interval between the tuberculin test prior to beginning the six weeks service in the sanatorium and the tuberculin test three or four weeks after the service is ended, by 5.2, which is the number of times ten weeks will go into a year. In using this figure the authors consider the whole ten weeks as spent in the tuberculosis environment, even though only six weeks of that time is spent at the sanatorium.

The authors also mention the fact that a tuberculosis service has been established "at the Minneapolis General Hospital, where attempts are being made to perfect a technic which will prevent attendants from acquiring infections with tubercle bacilli while working with tuberculous patients." This will be designated as hospital D. The technic used consists, in the main, of changing a cap, mask and gown and scrubbing the hands and arms for two minutes before the care of each patient in the same ward. The tuberculosis service consists of one thirty bed floor in the contagious unit. While the student nurse is assigned to

the contagious unit for six weeks, she does not spend more than two weeks of that time on the tuberculosis floor. However, not more than one half of the beds on this floor are set aside for the care of tuberculosis, and at times there have been as few as two tuberculous patients in that unit. Therefore her two weeks service there cannot be considered the equivalent of more than a one week service in a tuberculosis sanatorium, if that long.

In spite of that, another of the collaborators, Myers, at the meeting of the Canadian Tuberculosis Association held in Winnipeg in September 1939, reported that during a certain twelve months period ten of the eighty-nine nurses who were tuberculin negative at the beginning of their contagious service, two weeks of which is spent in the tuberculosis unit, were tuberculin positive at the end of that service. However, he stated that four of the ten had cared for open cases of tuberculosis elsewhere than in the tuberculosis service and so should be excluded from the study. This reduced the number who apparently acquired a tuberculous infection in the new tuberculosis service to six. This was 6.7 per cent of the eighty-nine. He stated further that it was the lowest "crude annual primary infection attack rate" that he knew of in connection with any tuberculosis service in the country, and he attributed the so-called low rate to the type of contagious technic used.

No allowance was made at hospitals A, B or C for any source of infection outside of the tuberculosis service. That is not necessary for hospitals A and B, because the nurses spend their entire three years there and whatever infection they acquire outside the tuberculosis service would be included in their average annual infection rate. However, it is a very important consideration for hospital C, as the nurses spend only six weeks in the tuberculosis service and then go back to their regular environment. In this instance the tuberculosis service is charged with all the infection that developed during the period under consideration (ten weeks).

The second point deals with the statement made by the authors on the effect of the length of contact with tuberculous patients on the infection rate when, in comparing the "crude annual primary infection attack rates" in hospitals A and B, the authors state that "the increases in infections recorded for the two groups of nurses who worked in wards for tuberculous patients were roughly proportional to the length of time each group spent in this type of service." Accepting that statement as true, one can then multiply 6.7 per cent, the so-called annual infection rate following a one week exposure in the tuberculosis service in hospital D by 6, representing a six weeks contact at the sanatorium for nurses from hospital C. This results in a six weeks infection rate of 40.2 per cent at hospital D in contrast to one of 22.2 per cent for hospital C. Using the same statistical method as the authors did in arriving at the crude annual primary infection rate of 115.4 per cent for hospital C, one would multiply the 40.2 per cent by 5.2, as that is the number of times ten weeks will go into fifty-two weeks. This gives the student nurses who have worked in the tuberculosis unit at hospital D a "crude annual primary infection attack rate" of 209.04 per cent.

This rate is, of course, impossible for at least two reasons: (1) more than 100 per cent of nurses cannot become infected, and (2) even though the nurses work in the tuberculosis service for a year there would be a few who would not react positively to the tuberculin test. Still it is no more absurd than is the rate of 115.4 per cent, which the authors give as the "crude annual primary infection attack rate" for the tuberculosis service at the sanatorium. In spite of its absurdity, I believe it does prove rather conclusively that the elaborate contagious technic in use in the tuberculosis unit of hospital D has not been any more effective, if as effective, in preventing the transmission of infection from patient to nurse than the technic in use at the sanatorium.

It seems to me that when one begins to compare "crude annual primary infection attack rates" one should use comparable facts in arriving at conclusions and not compare a three year period for one hospital with only a six weeks tuberculosis service in another hospital. When like is compared with like, there is some basis for judging the results, but when dissimilar things are compared one has no justification whatever in drawing any particular conclusions from the study.

E. S. MARIETTE, M.D., Oak Terrace, Minn.
Superintendent, Glen Lake Sanatorium.

GRADE A VERSUS GRADE B MILK IN NEW YORK CITY

To the Editor:—Mayor LaGuardia's public proclamation urges substitution of grade B for grade A milk to combat the high cost of the de luxe product. Two issues are involved: cost and quality. Economy is a great revenue to thrifty adults but a selective virtue to helpless infants. Grade A milk is still the most economical food for infant nutrition when compared with the total cost of equivalent nutrients. If it can be made available at less cost, so much the better. Until then, superior milk should remain the choice for infant feeding.

Grade A is preferable to grade B milk for infants because of superior bacteriologic control. The former averages about 50,000 bacteria per cubic centimeter before pasteurization while the latter averages about 250,000 per cubic centimeter. The bacterial count of milk is an index of the sanitary quality. Although milk with a high bacterial count is not necessarily harmful to health if the flora is innocuous, milk with a low bacterial count may be unsuitable if charged with pathogenic organisms. Metabolic studies of artificially fed infants have shown that boiled milk with a high bacterial count is less efficiently utilized and more apt to produce digestive disturbances than boiled milk with a low bacterial count.

Sanitary supervision of the milk supply contributed greatly to lowering the incidence of gastrointestinal diseases in infants. Why retrogress? If grade A milk is to be eliminated from the sanitary code, certified milk with less than 500 bacteria per cubic centimeter should be advocated for infants and grade B milk for older children and adults.

I. NEWTON KUGELMASS, M.D., New York.

SENSITIVITY TO SOLUTION OF POSTERIOR PITUITARY

To the Editor:—The January 20 issue of *THE JOURNAL* carries a letter by Bernard Seligman citing a case of hypersensitivity to solution of posterior pituitary and mentioning McMann's report in the Oct. 14, 1939, issue. Both cases showed general collapse. I do not know whether urticaria following injection of this substance, but without the collapse symptoms, is rare but cite the following:

For the induction of labor, my wife was given 1 minim (0.06 cc.) of solution of posterior pituitary hypodermically, and the injection was followed in ten or fifteen minutes by an urticarial eruption. The eruption was general, caused a great itching and was relieved by epinephrine after half an hour. Following delivery she was given solution of posterior pituitary again by mistake (the nurse had been ordered not to give it); the urticaria again followed and was again relieved by epinephrine. There was no respiratory distress, the pulse remained strong, regular and at about the same rate during the period of urticaria; the epinephrine was given to relieve the itching, not because any circulatory failure was impending. Pituitary had been given after two previous deliveries but without any unusual reaction.

A. L. ABBETT, M.D., Oakland, Calif.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TUBERCULIN TESTING METHODS

To the Editor:—There has been a great deal of agitation in regard to the method of tuberculin testing of human beings. Some advocate the Pirquet, others the Mantoux and still others the patch test. I recently read an article by Wolff, of San Francisco, on the technic of a percutaneous test in which he stated that the results of his ointment were practically equal to the Mantoux test. I have since gone through the literature but have been unable to find verification of this work. Might I have your opinions of the value of patch tests with the various ointments in use and the relation of this procedure to the Mantoux test.

Edward M. Jeppson, M.D., Ogden, Utah.

ANSWER.—In 1890 and for thirteen years thereafter, tuberculin for testing was administered by the subcutaneous method. The doses were large and constitutional reactions manifested by such symptoms as temperature elevation and malaise were important in determining the presence of tuberculosis.

In 1903 Pirquet conceived the idea of making a shallow scarification in the skin and applying tuberculin in order to produce a local reaction and avoid constitutional manifestations. In 1907 Pirquet (*Deutsche med. Wchnschr.* 33:865, 905, 1907) published the results of his work. Unfortunately, the test became known as the Pirquet test rather than the cutaneous tuberculin test. Pirquet's method of administering tuberculin has been extensively used. The chief objection to the administration of tuberculin by Pirquet's method is that there is no way of knowing how much tuberculin actually reaches the abraded area. Its administration is also time consuming. Moreover, in some cases the tuberculin is promptly rubbed from the area by the patients and so little is left as to result in no reaction. However, today in the hands of experts such as Slater, of Minnesota, and Chadwick, of Massachusetts, the cutaneous tuberculin test of Pirquet is satisfactory in determining the presence or absence of sensitivity of tissues to tuberculo-protein.

In 1908 (*München. med. Wchnschr.* 55:217, 1908) a method of administering tuberculin was reported which consisted of using a pomade of equal parts of hydrous wool fat and pure tuberculin. This was rubbed over an unabrased area of skin about 5 cm. in diameter for one minute. The area was then exposed to the air for ten minutes and no dressing was applied. Unfortunately, this became known as the Moro test rather than the transcutaneous or percutaneous test. Since Moro presented his work a number of physicians have slightly modified his method of administration. For example, Lovett (*Am. J. Dis. Child.* 37:918 [May] 1929) found that by vigorously rubbing an area of skin over the sternum with ether much of the oil was removed from the pores. Therefore, when a piece of concentrated old tuberculin the size of a pinhead was rubbed into the area, more entered the pores and a much better result was obtained than by Moro's original method.

In 1933 Wolff (*Am. Rev. Tuberc.* 27:308 [March] 1933) reported a modification of the percutaneous test of Moro, which consisted of first cleansing an area in the paravertebral region between the eighth and eleventh thoracic vertebrae with green soap and water, and after drying it was bathed with benzine to remove the oil from the pores. To the area he applied a special tuberculin ointment the size of a pea. This was covered with a piece of adhesive tape 2 inches square, which was tightly applied. By this method Wolff reported good results from the standpoint of determining the presence of sensitivity to tuberculin.

Vollmer (*Am. J. Dis. Child.* 54:1019 [Nov.] 1937) has introduced another modification of the percutaneous test of Moro which is designated as the tuberculin patch test. Its administration consists of cleansing an area of skin with acetone, ether or benzene, after the removal of any hair that may be present. The patch to be applied consists of a strip of tape to which has been attached two squares (1 by 1 cm.) of thin filter paper saturated with undiluted tuberculin and dried. These are placed on the tape 1 cm. apart. The adhesive side of the tape is protected with crinolin, which must be removed before the application of the patches. The tape is then tightly applied with the patches adjacent to the skin, where it remains for forty-eight hours. It is best to allow another forty-eight hours to elapse after the removal of the patches before reading the test.

Vollmer and Goldberger (*Am. J. Dis. Child.* 57:1272 [June] 1939) have reported that this test is equal in determining the

presence of sensitiveness to tuberculin to the intracutaneous test, when 0.1 mg. of old tuberculin is used. Unfortunately the intracutaneous test is not considered complete until the individual who has failed to react to smaller doses has been tested with a full milligram of tuberculin. When the second dose is not administered, the test may fail in as many as 10 to 20 per cent of persons whose tissues are sensitized to tuberculin. To overcome this discrepancy, Vollmer has recommended that all persons who do not react to the patch test have an intracutaneous test administered with a full milligram of tuberculin.

Objections which have been presented to the tape and patch methods of administering tuberculin are: 1. It is time consuming. 2. Many persons object to having adhesive tape on the skin and a few are highly sensitive to adhesive tape. Many complain of the itching sensation produced by the tape. 3. With excessive perspiration, such as may occur among students in gymnasiums, athletes or adults whose work causes perspiration, the adhesive tape may actually fall off. 4. Many persons dislike to omit bathing for forty-eight hours while the tape is on the skin. 5. The subject who does not react to the patch test must be seen five times: (a) to apply the tape, (b) to remove it, (c) to observe the area forty-eight hours later, (d) to administer the intracutaneous test and (e) to observe the area for presence or absence of reaction.

In 1908 Mantoux (*Compt. rend. Acad. d. sc.* 149:355, 1908) presented a method of administering tuberculin which consisted of introducing with a fine hypodermic needle into the layers of the skin a measured amount of tuberculin. This, unfortunately, is spoken of as the Mantoux test rather than the intradermal or intracutaneous tuberculin test. Usually 0.1 cc. of a dilution of 1:10,000 or 1:1,000 of tuberculin is administered as the first dose, that is, 0.01 or 0.1 mg. of tuberculin. If no reaction occurs in from forty-eight to seventy-two hours the test is repeated by using 0.1 cc. of a dilution of 1:100. This amounts to 1 mg. of tuberculin. If no reaction occurs the individual being tested is thought to be free from tuberculous infection. When purified protein derivative is used, the corresponding doses are administered.

There are persons who object to instrumentation, including needles, for any purpose. However, where good health education work has been done, these persons are greatly in the minority. The fact that this minority refuses the test is not a good argument against it because its administration differs little or not at all from the method employed in giving Dick or Schick tests. Moreover, in administering such immunizing substances as toxoid, the same sized needle is used as in the administration of the tuberculin test.

The advantages of the intracutaneous method are that a measured amount of tuberculin is introduced and remains exactly where we desire it to be; it cannot be removed by the subject. No tape or bandaging of any kind is necessary. Little time is consumed in administering the test. Where large numbers are to be tested and there is good organization, a single experienced physician is able to administer several hundred tests an hour.

This has become the standard method of administering tuberculin in this country and is strongly recommended by practically all organizations engaged in tuberculosis work.

SUBSTANCES INTERFERING WITH TESTS FOR ALCOHOL IN URINE

To the Editor:—Will you kindly tell me whether or not there is anything that will give the alcohol test in urine besides alcohol?

B. C. Boston, M.D., Waterloo, Iowa.

ANSWER.—Reducing substances are found in distillates from normal urine to the extent of about 0.003 per cent. The quantity is too small to interfere with the test for alcohol when used to confirm alcoholic influence. The reducing substances have not been completely identified, but Harger has shown that they arise at least in part during the process of distillation. It has been said that ether, acetone and chloroform may give false readings for alcohol. These substances have been proved to be without influence in the test for alcohol when potassium bichromate is used as a direct oxidizing agent according to a technique described by Heiser in the *American Journal of Clinical Pathology* 4:182 (March) 1934. Since this paper was written it has been discovered that formaldehyde, which may appear in urine from the ingestion of methenamine, may reduce potassium bichromate to a slight extent. In order to get some specific information, 1 Gm. (15 grains) of methenamine was taken by mouth and repeated urinalyses revealed a maximum reduction of potassium bichromate corresponding to 0.021 per cent of alcohol by weight. Formaldehyde in the urine can be detected with ease and can be removed from the distillate.

VALVULAR HEART DISEASE AND PREGNANCY

To the Editor:—A woman aged 27 who has valvular heart disease (mitral) with some pulmonary edema is about seven months pregnant. I am worried as to which is best: to protect the mother by an early delivery in about thirty days or to protect the baby and let the mother go to term. She rests two hours, is up two and uses four pillows to sleep, taking 1½ grains (0.1 Gm.) of digitalis daily. She has blood pressure of 96 systolic and 76 diastolic and a pulse rate of 108; her feet are not swelling, and on gross examination the urine was almost normal. If she goes to a hospital, what is the best way to induce premature labor?

Nathaniel J. Bucklin, M.D., Roodhouse, Ill.

ANSWER:—It seems probable that the pulmonary congestion or edema present in this young woman with mitral stenosis is due not to heart failure but to the combined and mechanical effect of mitral stenosis, tachycardia and the extra work of pregnancy. It will probably be safe to allow her to go to term if she remains quiet in bed and chair in order to keep the heart rate down and uses digitalis for the same reason. The heart strain will become less in the last month and it is probable that she will deliver herself. There is likely to be more strain caused by inducing premature labor now than by carrying out the measures that have been mentioned.

TONSIL REMOVAL BY WARING SUCTION METHOD

To the Editor:—Will you please advise me as to how the Waring suction technic and method for the removal of tonsils is regarded by laryngologists—its merit or advantages, if any, and its disadvantages, if any.

R. A. Young, M.D., DuBois, Neb.

ANSWER:—The Waring suction technic and method for the removal of tonsils is not in as widespread use as dissection and the various forms of the Ring instrument technic. The advantages claimed are that blood and infectious secretions are kept out of the field of operation and the possibilities for inhalation are thereby much reduced. From the standpoint of trauma, the average operator would probably obtain with this method a smoother tonsillar fossa and be much less apt to tear tissues than would be the case in an indifferently performed dissection operation. This would not hold for the experienced dissector or user of instruments such as the Sluder and the Beck tonsillectomes.

SULFANILAMIDE IN LEUKEMIA

To the Editor:—Are there any contraindications or therapeutic reasons for the use of either sulfanilamide or sulfapyridine in acute myelogenous leukemia?

M.D., Illinois.

ANSWER:—There is no reason to believe that the use of either sulfanilamide or sulfapyridine is contraindicated in acute myelogenous leukemia, provided a definite indication for its use in the control of an infectious process arises. Neither of the drugs has had any effect in the control of either acute lymphatic or myelogenous leukemia, and there is no reason to believe that they will depress the granulocytic element in the bone marrow unless the patient happens to have a peculiar idiosyncrasy to these drugs. Any treatment with either of these drugs designed to affect the white blood cells directly is highly experimental, and its therapeutic value is extremely questionable.

GLASS EATING

To the Editor:—In Queries and Minor Notes in The Journal Dec. 23, 1939, page 2341, was an inquiry from M.D., Connecticut, relative to eating glass. I was called to a nearby fire-house to witness a Negro about 40 years old who, in my presence, (1) chewed and swallowed two safety razor blades, (2) swallowed several 8 penny nails, (3) chewed and swallowed several large pieces of broken milk bottle glass, (4) inserted and closed a safety pin through the glans penis and (5) inserted a safety pin through the left biceps muscle. I looked into his mouth. His teeth were ground down flat. The buccal mucosa was thickened and grayish. He told me he was never operated on for obstruction and passed everything he swallowed, only rarely resorting to digital extraction. This practice had been engaged in for the previous fifteen or twenty years.

Anthony Ambrose, M.D., Newark, N. J.

REACTION TO SOLUTION OF POSTERIOR PITUITARY

To the Editor:—I recently had a reaction to solution of posterior pituitary in a multipara to whom I had administered it in four previous deliveries. On January 19 at 3 a. m. I administered 0.5 cc. of solution of posterior pituitary. After about five minutes the patient complained about itching of the back. An alcohol rub did not stop it. A rash quickly spread over all the skin, which became scarlet with both small and large wheals. This was followed by choking and a feeling of a hardness of the tongue. A quick injection of epinephrine worked rapidly. After twenty-four hours the mother and baby were in good condition. However, the site of the injection, about the size of a half dollar (30 mm.), remained swollen and red.

G. E. Paolazzi, M.D., Canton, Ohio.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examination of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, February 24, page 681.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: Basic Science. Tucson, March 19. Sec., Dr. Robert L. Nelson, 111 E. Broadway, Tucson. Medical. Phoenix, April 2-3. Sec., Dr. J. H. Brown, 826 Security Bldg., Phoenix.

ARKANSAS: Basic Science. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. Medical (Regular). Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison. Medical (Eclectic). Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, April 17. Written examination. San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N. St., Sacramento.

COLORADO: Basic Science. Denver, March 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver. Medical. Denver, April 2-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: Medical. Hartford, March 12-13. Endorsement. Hartford, March 26. Sec., Dr. T. P. Murdock, 147 W. Main St., Meriden. Homeopathic. Derby, March 12-13. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Examination. Dover, July 9-11. Reciprocity. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: Basic Science. Washington, April 22-23. Medical. Washington, May 13-14. Sec., Dr. George C. Rubland, 203 District Bldg., Washington.

FLORIDA: Basic Science. De Land, May 25. Sec., John F. Conn, De Land. Medical. Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, April 2. Dir., Bureau of Occupational Licenses, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, April 2-4. Acting Superintendent of Registration, Mr. Lucien A. ...

INDIAN: 18-20. Sec., Board of Medical Registration and Bowers, 301 State House, Indianapolis.

IOWA: Medical. Des Moines, March 4-6. Basic Science. Des Moines, April 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Building, Des Moines.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 5-7. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, March 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Medical. Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homeopathic. Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, March 12-14. Sec., Board of Registration of Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: Basic Science. Minneapolis, April 2-3. Sec., Dr. J. Charnley McKinley, University of Minnesota, 126 Millard Hall, Minneapolis. Medical. Minneapolis, April 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson.

MONTANA: Reciprocity. Helena, April 1. Examination. Helena, April 2-3. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEBRASKA: Basic Science. Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: Reciprocity with oral examination. Carson City, May 6. Sec., Dr. Frederick M. Anderson, 215 North Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Reciprocity. Columbus, April 2. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Basic Science. Oklahoma City, May 9. Medical. Oklahoma City, June 5-6. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: Basic Science. Corvallis, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PUERTO RICO: Santurce, March 5. Sec., Dr. O. Costa Mandry, Box 3854, Santurce.

RHODE ISLAND: Providence, April 4-5. Sec., Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: San Antonio, June 20-22. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, March 4-6. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: Basic Science. Madison, April 6. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. Medical. Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

Book Notices

Supervision in Public Health Nursing. By Violet H. Hodgson. Supervisor, Outpatient Tuberculosis Nursing, New York State Department of Health. Cloth. Price, \$2.50. Pp. 376, with 21 illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1939.

Every public health nurse should read Violet Hodgson's new book and for every supervisor or administrator concerned with public health nursing the book is an essential. The basic theme underlying this work is that successful supervision is based on democratic principles and that the exercise of arbitrary authority fails to secure the best performance from the staff nurse. One would hardly venture to disagree with this principle; it is idealistic and in keeping with our national philosophy. Yet we owe, in modern nursing, much to the traditional military system of organization, which has given us an understanding of the importance of clear lines of responsibility and authority. In stating the ideal democratic basis for supervision in public health nursing Mrs. Hodgson has perhaps overstressed its case. The two chapters dealing with the teaching function of the supervisor are excellent and give a proper emphasis to this phase of the supervisor's work; it was particularly wise to include here the laws of learning. In a book written for specialists who are expected to have a background in their field, one would not expect to find quite so much detailed description of historical developments. However, this is not a weakness in the book—it is merely time consuming for the reader, who will most likely be a busy supervisor or other professional worker. Since, as the author points out, there has been a great increase of public health nursing under official auspices, one could expect greater space and emphasis given to supervision under conditions found in public agencies. Civil service and problems of supervision connected with it are not discussed at all. This is a real and unfortunate omission. The book is the most authoritative word on its subject. It deserves, and will receive, wide attention and it undoubtedly will become an influential factor in shaping relationships and directions taken in public health nursing agencies throughout the land.

The Diagnosis and Treatment of Diseases of the Esophagus. By Porter P. Vinson, B.S., M.A., M.D., Professor of Bronchoscopy, Esophagoscopy and Gastroscopy, Medical College of Virginia, Richmond, Virginia. Cloth. Price, \$4. Pp. 224, with 98 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, Publisher, 1940.

This is a good book and a much needed one. For years most patients with diseases of the esophagus have been receiving poor treatment largely because there are so few men in the world who have enough material of this one type to become expert in diagnosis and treatment. Unfortunately also, for some curious reason, some of the men who have written the few available books and articles on the esophagus seem to have been unaware of the fact that in 1898 Russell, of England, devised a simple apparatus by means of which strictures in the esophagus and spasmodic contractures at the cardia can be dilated with a high degree of safety. A recently published book on the esophagus still advocated the retrograde attack on cardiospasm through a fistula in the stomach. As Vinson says (p. 14), gastrostomy is associated with a surprisingly high mortality; it rarely provides grateful palliation in cases of cancer of the cardia and it is quite unnecessary in most of the cases of benign obstruction in esophagus and cardia. Excellent results can be secured without it. Dr. Vinson began writing his book with the tremendous advantage of having had an enormous experience in this field. For years he, Dr. Henry Plummer and Dr. Herman Moersch took care of the patients with esophageal diseases drawn from the huge material seen at Rochester, Minn. Perhaps the commonest of these diseases is cardiospasm, and this can usually be relieved easily by the Russell-Plummer technic. First the patient is made to swallow a thread. This finds its way through the narrow place and passes on down into the small bowel, where it becomes sufficiently anchored so that traction can be made on it. Olive shaped dilators are then passed over the thread and down through the obstruction. After the narrow place has been dilated to size 60 French, the hydrostatic dilator of Russell is brought into play. The preliminary use of the sound so

completely eliminates the danger of rupture of the esophagus that in the last 450 cases Vinson has had no death from this cause. Strangely enough, strictures due to carcinoma of the esophagus can also be dilated and with only a small risk. Such dilation gives many patients a large degree of relief. There are several chapters in the book on the rarer diseases of the esophagus, hysterical dysphagia, esophageal diverticula, cicatricial stenoses, foreign bodies, and stricture of the esophagus due to pressure from outside. Vinson states that almost all patients with benign stricture of the esophagus can be relieved completely and permanently of difficulty in swallowing if the treatment which he outlines is promptly employed and faithfully carried out. Usually the esophagus has to be dilated at intervals for two years. Gastrostomy rarely has to be done. In the book there are two valuable chapters on the technic of esophagoscopy and on the general handling of patients. This little volume should greatly improve the treatment now being given to patients with esophageal disease throughout the world.

Beiträge zur Frage der normalen Genese der Blutzellen. Die Entstehung der fötalen Erythromyelopoese in Leber und Milz und das Vorkommen von Myelocyten in der normalen Milz und Thymus. Von Arne Bertelsen. Denne Afhandling er af det Ilegerdenskabellige Fakultet antaget til offentlig foravars for den medicinske Doktorgrad, København, 1938. Paper. Pp. 272, with 36 illustrations. Copenhagen: Levin & Munksgaard; Ejnar Munksgaard, 1938.

The work is a doctor's thesis, which probably accounts for the long and repeated discussions of theories regarding origin and relations of blood cells and for the extensive tabular matter. The book is devoted to the problem of extramedullary erythromyelopoiesis in the spleen, liver and thymus of normal human fetuses of the seventh, eighth and ninth months, the prematurely born, the newly born and the infant, child and adult, with the object of determining the normal limits of extramedullary blood formation in these age groups. The material was by far the most extensive and best controlled of any series used for study of this problem. Trauma in one form or another was the most frequent cause of death. Only cases in which the necropsy revealed no pathologic changes were included in the series regarded as normal. A few pathologic cases were studied for comparison with the corresponding normal age groups. While it is generally conceded that extramedullary myelopoiesis is to be seen in late fetal stages, only a few investigators believe that it extends beyond the newborn under normal conditions. Bertelsen's observations for liver, spleen and thymus are in agreement with those of the latter authors. His proof is submitted in great detail; it includes thirty-six photomicrographs and slightly more than 100 pages of tables in which the number of hematopoietic foci and differential counts of normoblasts and myelocytes seen in a specified number of microscopic fields (Leitz objective 3, ocular 8) of sections are listed. The results are discussed from the standpoint of the leading hematologic theories, with the conclusion that the unitarian theory gives the best explanation of the observations. The literature pertaining to the problem is reviewed critically and in detail.

The liver was studied in twenty-one fetuses of the seventh month, twenty-seven of the eighth month, twenty-two of the ninth month, thirty-two newborn (full term) and two infants 14 days and 6 weeks of age. Seven premature infants and nine malformed fetuses were studied. The author found hematopoietic foci in the connective tissue of the portal canals and in the hepatic trabeculae and sinusoids of the lobules. The majority of intralobular foci are in the sinusoids, but some are located between the liver cells of the trabeculae and show no connection with the sinusoids. These foci are composed of myeloblasts, normoblasts in different stages of development, and a few myelocytes. The extravascular location of many of these foci is not in harmony with the view of Sabin and Doan that erythropoiesis is always intravascular and that the cells originate from endothelium. The author did not see any evidence favoring an endothelial origin of any of the blood cells. Both myelocytes and granulocytes could be traced to the "hemocytoblasts" (myeloblasts), which are most numerous in the fetal stages. Myelocytes are most abundant in the portal foci. While the number of foci is reduced from the seventh fetal month to birth, their size and cellular composition remains constant. All the livers of thirty-two newborn infants contained intralobular hematopoietic centers, and in nine of them there were from twenty-five to eighty-five

such centers for each microscopic field. From this the author concludes that liver hematopoiesis must be more extensive than is shown from his series to be normal before a diagnosis of fetal erythroblastosis or hydrops congenitus is justified. Hepatic foci were still present in the two weeks and six weeks old infants. As normal material from age 6 weeks to 3 years was not available, it was impossible to determine the age at which liver hematopoiesis terminates. It was not seen in normal children and adults. Intralobular hematopoiesis was reduced in the seven premature infants studied, but the portal foci were large and the number of their myelocytes increased. Extra-uterine life, therefore, seems to suppress intralobular erythropoiesis and to favor myelopoiesis in the portal tissue. Local intravascular development of myelocytes was noted in the fetal livers, and in these livers the extravascular erythropoietic centers were most numerous, which favors the Mollier view that hematopoiesis in the liver is at first extravascular and later intravascular. Bertelsen could find only an occasional extravascular focus in the liver lobules of the newly born.

All the spleens of the premature and newborn infants of this series showed evidence of myelopoiesis and erythropoiesis in both pulp and follicles. In the pulp the cells were scattered or occurred in small groups, often in the marginal zone of the follicles. From the seventh fetal month to full term birth the normoblasts were reduced from an average of 24 per immersion field to 12, and they and the myelocytes were found in the spleens of all newborn infants. The erythroblasts and myelocytes are in different stages of development and so must be assumed to be of local origin. Eosinophilic myelocytes were found in all of forty-one spleens in cases of traumatic death at ages of from 4 to 89. A few neutrophilic and basophilic myelocytes were also seen, and a few myelocytes were located in the follicles. Erythroblasts were not found in this age group. The granulopoietic function is therefore retained to extreme old age, while the development of red cells terminates soon after birth, although the exact period could not be determined.

Erythroblasts were not seen in the thymus of the adult in a single case. An occasional erythroblastic focus was seen in this organ at the end of fetal life, while only single scattered erythroblasts were observed in the late fetuses. Myelocytes, however, were numerous and were found at all ages as long as the organ persists. Eosinophil myelocytes predominated, as was also true of the spleen. Myelopoiesis is not reduced at the end of fetal life as it is in the other organs showing extramedullary hematopoiesis, and it is more extensive than in the other organs. An occasional myelocyte was found even at age 65. The myelocytes were seen to be in various stages of development and they were associated with large, basophilic hemocytoblasts and so must have been of local origin. The presence of small, dark "trachy-chromatic" nuclei identical with those of the smaller lymphocytes is interpreted as evidence for the direct origin of some of the myelocytes from lymphocytes. In the fetus the myelocytes are associated with more hemocytoblasts, which are probably derived from the perivascular and septal mesenchyme, than is the case in the adult. A few myelocytes with lymphocytic nuclei were also seen in the fetus. From these observations the author concludes that the thymus continues to function as a granulopoietic organ and that in the adult the myelocytes are derived largely from lymphocytes, and in the fetus from both lymphocytes and mesenchyme.

Failure of the Circulation. By Tinsley Randolph Harrison, M.D., Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee. Second edition. Cloth. Price, \$4.50. Pp. 502, with 61 illustrations. Baltimore: Williams & Wilkins Company, 1939.

This edition is considerably longer than the initial one chiefly because it includes an extensive section on angina pectoris covering about seventy pages. The author emphasizes the importance of sudden death when the myocardium is in need of oxygen. He refers to experimental work of several authors regarding the production of ventricular fibrillation by anoxia. Harrison condemns such diagnoses as pseudo-angina. In the remainder of the book the general pattern of the first edition is followed. Much of the material comes from earlier papers of the author and his associates. This section contains sound descriptions of the origin of the cardinal symptoms of congestive heart failure, dyspnea and edema. Harrison champions the "backward failure" theory advanced by James Hope a century ago. The evidence

presented seems to justify this contention. The entire book is well documented with more recent references. There is an index. The chief merit of both editions is the application of physiologic observations to clinical practice. Repeatedly the author brings up minor points in treatment which are logical outgrowths of experimental work. This "physiologic" attitude toward the care of patients makes the book desirable reading for all students specializing in diagnostic or cardiac work. The volume would help the preparation for examination by the American Board of Internal Medicine. It will find application as supplementary reading for students in physiology. Its general utility as a textbook for reference in applied cardiovascular physiology remains preeminent. No physician would fail to learn much by reading it in continuity.

Health Facts for College Students: A Textbook of Individual and Community Health. By Maude Lee Etheredge, M.D., Dr.P.H., Professor of Hygiene and Medical Adviser for Women, University of Illinois, Urbana. With a foreword by Ray Lyman Wilbur, M.D. Third edition. Cloth. Price, \$2. Pp. 410, with 65 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

College students as well as others are being constantly bombarded, through newspapers, moving pictures and general conversation, with medical propaganda and advice concerning diet and other facts about health. Hence it seems important that they be supplied with simple and authoritative material on personal and public health. This book is not meant to be a work of a highly technical nature. Rather it is designed to furnish health facts to college students so that they may maintain the highest degree of efficiency and physical and mental hygiene. It is easily read and includes just enough technical material so that the college student will understand the purpose of the author. The illustrations are easily understood. There are included chapters on alcohol and its relation to the nervous system, smoking, narcotics, heredity, friendship and marriage, allergy and mental health and hygiene. The book can be recommended for college students and should help them in deriving important facts concerning health.

Proctoscopic Examination and Diagnosis and Treatment of Diarrheas. By M. H. Streicher, M.S., M.D., Assistant Professor of Medicine, University of Illinois College of Medicine, Chicago. Cloth. Price, \$3. Pp. 149, with 39 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1940.

Part I gives a clear, concise and well illustrated method for the performance of proctoscopic examination. It is based on the author's large experience in this field and offers many practical suggestions which will facilitate the examination. Part II includes a classification of diarrheas from the etiologic standpoint and a brief discussion of treatment. The author has attempted to cover too much ground in too short a space. The classification, treatment and references are incomplete, so that the second portion of the book suffers by comparison with the first portion.

The Essentials of Medical Treatment. By David Murray Lyon, M.D., D.Sc., F.R.C.P., Professor of Clinical Medicine, The University, Edinburgh. Cloth. Price, 15s. Pp. 448, with 19 illustrations. Edinburgh & London: Oliver & Boyd, 1939.

In the preface to this new book from the Edinburgh school it is stated that the author's primary object has been "to survey the whole range of therapeutic measures, and demonstrate the full resources of modern medicine." Unfortunately it does not seem that these objectives have been fully attained. A considerable amount of information regarding approximately 120 disease states is conveyed, but the recitative manner of its delivery is so redolent of the old style of didactic clinical lecture that one is taken back most unpleasantly to the lecture amphitheater, now happily passé in most leading American schools. The book reads pleasantly—some of the old clinical lectures were delightful to listen to—but the pages do not spring to life and offer help to one who consults them, as those of a textbook of therapeutics might reasonably be asked to do. So thoroughly detached indeed is the entire work that the reviewer failed to find (others with greater diligence might succeed) a single instance in which the experience of the author or some other doctor or group of doctors is specifically referred to. Thus of course there can be no bibliography. The index seems to be adequate.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Privileged Communications: Privilege Once Waived Ceases to Exist.—The insured instituted three separate suits in the circuit court of St. Louis, Missouri, against the Metropolitan Life Insurance Company, apparently to collect certain benefits allegedly due him under an insurance policy. All three suits involved substantially the same issues. One suit was tried and was pending on appeal. The others were pending in the trial court. For use in the pending suits, the Metropolitan Life Insurance Company sought to obtain the deposition of a Denver physician. A commission was duly appointed in Denver but the physician refused to testify, relying on the protection of a statute making communications between physicians and patients privileged. The insurance company then petitioned the Denver district court for a subpoena requiring the physician to testify and to produce certain books, records and memoranda. The court sustained the refusal of the physician to testify and discharged him from the order to show cause why he should not be held guilty of contempt. The Supreme Court of Colorado was then asked by the insurer to pass on the question.

The testimony sought from the physician related primarily to hospital records showing the illness of the insured during the years 1925 to 1927 in a Denver hospital. The only question before the Colorado court was whether the privilege had been waived. In determining this question, said the court, the law of the forum governs, that is, the law of the state in which the suits on the insurance policy were pending, Missouri. In the suit that had already been tried in Missouri the insured, without objection, permitted two physicians employed at the Denver hospital during the years involved, 1925 to 1927, to testify about his illness. In the opinion of the Supreme Court of Colorado, this constituted a waiver of the privilege as applied to the testimony sought in the present proceedings. The purpose of the privilege, the court pointed out, is "to encourage confidence and to preserve it inviolate." When the patient permits, without objection, the confidential information to become public at a public trial, the reason for the privilege ceases to exist. Moreover, under the Missouri authorities, a waiver of privilege established through the testimony of one physician extends to all who have attended the patient for the same ailment, regardless of the time of such consultations, attendance or treatments. The privilege once waived ceases to exist, and when a waiver of privilege is once made it is general and not special and its effect cannot properly be limited to a particular purpose or a particular person. The trial court, therefore, should have required the physician to appear before it and to testify. The judgment of the trial court was therefore reversed and the cause remanded with directions to proceed in accordance with the views expressed by the Supreme Court.—*Metropolitan Life Ins. Co. v. Kaufman (Colo.)*, 87 P. (2d) 758.

Medical Practice Acts: Scope of Chiropractic in Iowa.—A licensed Iowa chiropractor, the defendant in this case, was enjoined by the Supreme Court of Iowa from practicing physical therapy and electrotherapy, from administering colonic irrigations and from prescribing diets. *State v. Boston*, 278 N. W. 291 (abstr. J. A. M. A. 111:1592 [Oct. 22] 1938). A rehearing was granted the defendant by the Supreme Court and a supplemental opinion rendered.

Section 2555 of the Iowa Code defines chiropractors as:

Persons who treat human ailments by the adjustment by hand of the articulations of the spine or by other incidental adjustments.

Section 2559 of the Code provides that a license to practice chiropractic shall not authorize the licensee to practice operative surgery or osteopathy, or to administer or prescribe any drug or medicine included in materia medica. The defendant chiropractor argued that the laws of Iowa make a chiropractor a member of the healing professions, with authority to use any agency in healing the sick except those agencies the use of which is expressly prohibited. But, said the Supreme Court in

this supplemental opinion, the practice of medicine and surgery is the practice of the healing art, and, unless restrictions be placed thereon by the legislature, the whole field of medicine and surgery is open to the practitioner. On the other hand, the practice of chiropractic, although recognized as a branch of the healing art, is only one form of the practice, within well defined limits, of the science of healing as such practice is defined by section 2555 of the Code. The legislature has prescribed, the court said, the method of healing which may be used by chiropractors and has further specified, by section 2559, other methods which may not be used. If section 2559 broadened the field in which the chiropractor may practice, the court continued, and if he has the right to go outside the restrictions and employ other methods not therein prohibited, then the whole field of medical science is open to him except as prohibited in that section. The court expressed belief that the practice of medicine and surgery includes physical therapy, electrotherapy, colonic irrigations and the prescribing of diet and that therefore chiropractors may not lawfully employ such modalities.

The defendant urged that the ruling of the court would bar the use of mechanical appliances or common instruments by barbers and others. The classes mentioned, the court pointed out, are not engaged in the practice of medicine or of healing nor are they holding themselves out to the public as healers. The reason for all laws restricting the activities of professions is the protection of the public, and the legislature has seen fit to enact laws governing the practice of the various forms of the art of healing, permitting each practitioner to follow his profession according to its established principles. Those persons who are authorized to practice one form of the art may not encroach on another form for which they have no authority from the state.

The Supreme Court, therefore, adhered to its former decision in this case.—*State v. Boston (Iowa)*, 284 N. W. 143.

Society Proceedings

COMING MEETINGS

- Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
- Alabama, Medical Association of the State of, Birmingham, Apr. 16-18. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association of Anatomists, Louisville, Ky., Mar. 20-22. Dr. E. R. Clark, Dept. of Anatomy, Univ. of Pennsylvania School of Medicine, Philadelphia, Secretary.
- American Association of Pathologists and Bacteriologists, Pittsburgh, Mar. 21-22. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.
- American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Lovelock, 4200 Pine St., Philadelphia, Executive Secretary.
- American Physiological Society, New Orleans, March 13-16. Dr. F. T. Bard, Johns Hopkins Medical School, Baltimore, Secretary.
- American Society for Experimental Pathology, New Orleans, March 13-16. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.
- American Society for Pharmacology and Experimental Therapeutics, New Orleans, March 13-16. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.
- American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
- Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie F. Kober, 15 East Monroe St., Phoenix, Secretary.
- Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brockton, 602 Garrison Ave., Fort Smith, Secretary.
- Federation of American Societies for Experimental Biology, New Orleans, Mar. 13-16. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.
- Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-25. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.
- Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. E. F. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
- Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. P. F. Adams, 416 Federal Securities Building, Lincoln, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 9-11. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glenn Bell, University of California Hospital, San Francisco, Secretary.
- Southeastern Surgical Congress, Birmingham, Ala., Mar. 11-13. Dr. Benjamin T. Beasley, 701 Hurt Building, Atlanta, Ga., Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

59:1-218 (Jan.) 1940

- *Treatment of Pneumococcic Infections in Children with Sulfapyridine. H. S. Christian, G. M. Jorgensen and Catherine Ellis, New York.—p. 1.
- Dietary and Metabolic Studies of Eskimo Children With and Without Dental Caries, Including Studies of Metabolic Balances of Calcium, Phosphorus and Nitrogen. E. H. Siegel, L. M. Waugh and M. Karshan, with technical assistance of Clare Lowenberg and Mary Segall, New York.—p. 19.
- Biochemical Studies of Saliva of Eskimos Correlated with Dental Caries and Occurrence of Salivary Calculus. M. Karshan, E. H. Siegel and L. M. Waugh, with technical assistance of Mary Segall, New York.—p. 39.
- Study of Feet of Infants and Children. A. Bloxsom, Houston, Texas.—p. 45.
- Weltmann Reaction and Sedimentation Rate During Rheumatic Fever of Childhood. R. I. Klein, S. A. Levinson and P. Rosenblum, Chicago.—p. 48.
- *Treatment of Impetigo Contagiosa with Rubber Containing 8-Hydroxyquinoline. M. Seldowitz, Brooklyn.—p. 67.
- Modification of Smallpox Vaccination in Susceptible Infants: Use of Specific Convalescent Serum. J. Greengard and A. M. Wolf, Chicago.—p. 76.
- *Pneumococcic Pneumonia of Type XIV in Children Treated with Specific Serum. J. G. M. Bullowa and M. Gleich, New York, with assistance, in the statistical study, of J. J. Cohen and Constance Lehair.—p. 84.
- Attempts to Enhance Virulence of Haemophilus Pertussis by Serial Passage in Guinea Pigs. J. A. Toomey and W. S. Takacs, Cleveland.—p. 94.
- Glutathione and Red Cells in Blood in Infancy and in Childhood. Helen McNamara and M. J. E. Senn, New York.—p. 97.
- Growth and Chemical Composition of Human Skeleton. W. W. Swanson and V. Iob, Chicago.—p. 107.
- Growth, Development and Care of the Child. H. Bakwin and Ruth Morris Bakwin, New York.—p. 112.
- Lipodystrophy: Report of Case, with Metabolic Studies. J. S. Harris and R. Reiser, Durham, N. C.—p. 143.

Sulfapyridine in Pneumococcic Infections of Children.

—During a seven months period, Christian and his associates treated 140 children with pneumococcic infections by means of sulfapyridine. Two hundred mg. of the drug per kilogram of body weight was given in divided doses during the first day and 100 mg. per kilogram a day thereafter. Except to a few of the older children, who preferred to swallow the tablets whole, the drug was administered by crushing the tablets and suspending the powder in a small amount of water, milk, fruit juice or honey. When vomiting occurred within an hour after a regular dose, the dose was repeated. One hundred patients had pneumococcic pneumonia. Seven of the 100 patients had otitis media with a purulent discharge from one or both ears, and a number of others had otitis media without rupture of the tympanic membranes. All had pneumococci in their upper respiratory passages and all had x-ray changes consistent with pneumonia. The blood for culture was taken from all patients, usually on admission and in many cases also just before treatment was started. Only four children had positive blood cultures. Twenty-seven per cent of the children were under 1 year of age, and 45 per cent were under 2 years. Discussing the mortality and complications, the authors say that one infant, who had mongolism and congenital heart disease, died after four days of treatment. Two patients had otitis media after administration of sulfapyridine was stopped, but on further treatment their ears improved without rupture of the tympanic membranes. Although 73 per cent of the patients vomited during treatment, only 57 per cent vomited more than once, and in a few cases vomiting was as severe before treatment was started as during it. Cyanosis has not been easy to evaluate because several of the patients were cyanotic at the time treatment was started. The cyanosis of some patients seemed to be definitely due to the drug. Further, the authors discuss the use of sulfapyridine in

pneumococcic disorders other than pneumonia. Of four patients who had early pneumococcic empyema, two who had received serum recovered with sulfapyridine therapy; the other two required rib resection in spite of treatment with sulfapyridine. Seventeen children with acute pneumococcic otitis media were treated with sulfapyridine. The average duration of the otitis media at the time treatment was started was four days and the longest duration was eighteen days. Other pneumococcic infections treated with sulfapyridine were primary pneumococcic peritonitis, osteomyelitis, meningitis, laryngotracheobronchitis, infections of the respiratory tracts without roentgenologic signs of pneumonia and pneumococcic wound infection. Five patients with nephrosis and one with asthma who were known to have been carriers of pneumococci were treated and in five cases the therapy was successful within two weeks. Some of the limitations of sulfapyridine were demonstrated in the two cases of pneumococcic meningitis in which death occurred and in a case of pneumonia in which bacteremia persisted during five days of treatment before antipneumococcus serum was given. Studies on absorption and excretion of sulfapyridine are presented and the authors direct attention to the occasional need for a preparation of sulfapyridine which can be given parenterally.

Impetigo Contagiosa.—According to Seldowitz, it has been demonstrated by Kahn and Carroll that rubber containing 8-hydroxyquinoline exhibits certain bacteriostatic properties, particularly in reference to the staphylococcus. In view of the bacteriostatic properties of this rubber base combination, it occurred to the author that the material might find therapeutic application in cases of certain types of pyogenic infections, mainly impetigo contagiosa. A study was made of its effect on thirty-eight children suffering from this infection. The children were divided into two groups. The first included those showing the bullous type of lesion, which was more common in young infants; the second group embraced those presenting the confluent, crusted type of lesion, which occurred more commonly in older children. The group with bullous lesions consisted of eleven patients. In the second group, those with crusted lesions, the infection often began with a small erythematous macule which rapidly developed into a flat pustular vesicle, and this was rapidly transformed into a dry crust resting on an inflamed base. Frequently a seropurulent discharge oozed from beneath the margins of the crust. In applying the rubber base substance, care was taken not to disturb the crusts mechanically. The importance of this has been strongly emphasized by Newman. The lesions were covered with a thin layer of gauze, and the rubber was applied over the gauze. The dressings were held in situ with adhesive plaster and were changed at intervals of from two to four days. The gauze was employed to absorb any secretions which might accumulate beneath the rubber, such as those resulting from liquefaction of the crust or from actual exudation from the lesion itself. The medicated rubber was found to operate as efficiently through the layers of gauze as when placed directly over the lesions. Some of the patients were treated at once with the medicated rubber. For control purposes others were subjected to a preliminary period of treatment with various agents. Summarizing the results of his treatment, the author says that thirty-five of thirty-eight patients were successfully treated with rubber containing 8-hydroxyquinoline. The average time for the disappearance of the crusts was three days. The skin returned to a normal appearance in an average of eight days. The lesions in three of the thirty-eight cases were refractory to this form of therapy.

Specific Serum in Children with Pneumococcic Pneumonia of Type XIV.—According to Bullowa and Gleich, the acceptance of serum therapy for children with pneumonia has been slow. Because of skepticism, the alternation of specific serum therapy was continued at the authors' hospital until evidence of its value was available in an adequate series of cases. Their observations have extended over ten years. Serum was administered when available to alternate patients. Except in nine cases the serum was administered intramuscularly, usually into the upper outer quadrant of the buttock, and the area was massaged for five minutes. After describing the determination of the type of pneumococcus the authors say that pneumococcus type XIV was found in 16.8 per cent of the cases. Its frequency

varies from time to time. From 1929 to 1936 an average of from twenty-two to twenty-three cases were observed each year. In the season 1937-1938, forty-nine cases were observed. Intramuscular injection of serum (followed by massage) was used in sixty-two cases; nine patients received serum intravenously, and three of them died. Twenty patients were treated with rabbit serum and two with horse and rabbit serum in the last two years and four months; all recovered. The dose was about the same in all cases, being from 50,000 to 150,000 units. The death rate in the entire series of cases in which serum was not used was 14.4 per cent. With serum the mortality was 4.2 per cent, a reduction of 70 per cent. The authors reach the conclusion that pneumococcus type XIV is the organism most frequently found in infants and very young children with pneumonia. The mortality is higher before the age of 3 years than after this age. With the use of specific serum in adequate amounts, fewer patients die, more patients with bacteremia recover, the disease is shortened and complications are fewer.

American Journal of Pathology, Boston

15: 657-818 (Nov.) 1939

- Toxoplasmic Encephalomyelitis: III. New Case of Granulomatous Encephalomyelitis Due to a Protozoan. A. Wolf, D. Cowen and B. H. Paige, New York.—p. 657.
Experimental Production of Endocarditis Lenta. W. J. MacNeal, Martha Jane Spence and Marie Wasseen, New York.—p. 695.
Study of Histologic Changes and Transplantation of Tissue Surrounding Methylcholanthrene Pellets During Latent Period of Tumor Development in Female C57 Mice. H. L. Stewart, Cambridge, Mass.—p. 707.
Studies on Experimental Rickets in Rats: III. Behavior and Fate of Cartilage Remnants in Rachitic Metaphysis. G. S. Dodds and Hazel C. Cameron, Morgantown, W. Va.—p. 723.
Essential and Paroxysmal Hypertension, Contrasted by Case Reports. F. H. Foucar, Washington, D. C.—p. 741.
Iron Hematoxylin Containing Ferric and Ferrous Iron. R. D. Lillie and W. R. Earle, Washington, D. C.—p. 765.
Effect of Yeast on Incidence of Cirrhosis Produced by Lead Arsenate. W. C. VonGlabn and F. B. Flinn, New York.—p. 771.
Primary Chorionepithelioma of Urinary Bladder in Male: Report of Case. T. Weinberg, New York.—p. 783.

Annals of Otol., Rhinol. and Laryngology, St. Louis

48: 873-1152 (Dec.) 1939

- Epidermoid Carcinoma of Pharynx, Buccal Mucosa and Larynx. D. M. Lierle, Iowa City.—p. 875.
Severe Injury to Larynx Resulting from Indwelling Duodenal Tube: Case Reports. S. Iglaue, Cincinnati, and W. F. Molt, Indianapolis.—p. 886.
Sepsis Following Pharyngeal Infections. C. Hall, Los Angeles.—p. 905.
Indications for Direct Laryngoscopy. C. L. Jackson, Philadelphia.—p. 926.
Experimental Studies on Enchondral Bone of Otic Capsule. W. P. Covell, San Francisco.—p. 934.
Deep Neck Infection. A. L. Beck, New Rochelle, N. Y.—p. 940.
Cerebral Edema as Cause of Intracranial Hypertension of Otic Origin. N. A. Levy, Chicago.—p. 999.
Irrigation of Maxillary Sinus Through Ostium: Clinical Study of 500 Cases. F. W. Merica, Lakewood, Ohio.—p. 1011.
Testing of Transmission Apparatus with Bone Conduction Receiver. J. H. Hülka, Long Island City, N. Y.—p. 1020.

Indications for Direct Laryngoscopy.—According to Jackson, direct laryngoscopy provides the only means of examining the larynx of infants and young children and is indicated in the presence of any symptom referable to the larynx in a child. Obstructive laryngeal dyspnea, stridor, wheezing, hoarseness or aphonia call for direct laryngoscopy as the most important diagnostic procedure and often the only means of treatment. Direct laryngoscopy has shown that the most common cause of stridor in infancy is congenital deformity of the epiglottis and supraglottic aperture. The condition is rarely serious and is generally outgrown during the second year of life without treatment. However, it is extremely important to diagnose it and to exclude other conditions which do require treatment and may prove fatal if not treated; for example, congenital subglottic webs, papillomas, bilateral abductor paralysis or dislocation of the arytenoids can be diagnosed accurately only by direct laryngoscopy. Obviously, a foreign body in the larynx of a child, as in an adult, constitutes an indication for direct laryngoscopic removal. In neonatal asphyxia, direct laryngoscopy should always be done for aspiration of laryngeal and tracheal secretions and to exclude high obstruction as a cause. Adult patients requiring direct laryngoscopy may be divided into two classes: those in which the larynx is imperfectly visualized by the laryngeal mirror and those in which the larynx

is well visualized by the mirror but some condition is revealed which calls for instrumental manipulation, such as biopsy, the removal of a benign tumor or dilation. An overhanging or deformed epiglottis is the most common cause of difficult visualization by the indirect method, though some other anatomic condition or an exceptionally intolerant throat may be at fault.

Bulletin New York Academy of Medicine, New York

16: 1-50 (Jan.) 1940

- The Adrenal Medulla. W. B. Cannon, Boston.—p. 3.
Hypothyroidism: Diagnosis and Treatment. J. H. Means, Easton.—p. 14.
Modern Treatment of Pyogenic Osteomyelitis. D. B. Phenister, Chicago.—p. 20.
Otitis Media and Its Extensions. E. P. Fowler Jr., New York.—p. 24.
Obstetrics at the New York Almshouse and at Bellevue Hospital. C. E. Heaton, New York.—p. 38.

Canadian Medical Association Journal, Montreal

42: 1-108 (Jan.) 1940

- Demonstration of Orally Active Medullotrophic Principle in Primæ Extract of Pituitary Tissue. J. B. Collip, Montreal.—p. 2.
Chronic Recurrent Ulceration of Leg. S. Gordon, Toronto.—p. 4.
Transverse Incision of Abdomen: Laparotomy Wound of Choice. F. B. Gurd, Montreal.—p. 10.
New Approach to Knee Joint. V. O. Mader, Halifax, N. S.—p. 17.
*Potassium Chlorate in Treatment of Poliomyelitis. J. Saucier and O. W. Stewart, Montreal.—p. 19.
Fatal Case of Accidental Poisoning by Chlorate of Potassium: Review of Literature. W. J. Cochrane and R. P. Smith, Halifax, N. S.—p. 23.
Anuria Caused by Sulfapyridine Therapy: Report of Case Successfully Treated by Operation. E. Smith, K. A. Evelyn and J. F. Nairn, Montreal.—p. 27.
Toxic Effects of Sulfanilamide and Related Compounds. E. H. Benson, Montreal.—p. 30.
Angina Pectoris: Case Study. E. P. Scarlett, Calgary, Alta.—p. 34.
Compression Fractures of Vertebral Bodies Following Induced and "Idiopathic" Convulsions. G. E. Reed and T. E. Dancey, Montreal.—p. 38.
Treatment of Mental Illnesses with Metrazol: Preliminary Report on Seventy-Six Patients. J. A. Cummins, Hamilton, Ont.—p. 39.
Routine Hearing Tests. D. E. S. Wishart, Toronto.—p. 46.
Maternal Mortality from the Point of View of the Obstetrician. P. A. McLeod, Kingston, Ont.—p. 53.
Psychologic and Medical Aspects of Excessive Use of Alcohol. G. H. Stevenson, London, Ont.—p. 57.
Pollen Disease in Western Canada. C. H. A. Walton, Winnipeg, Man.—p. 62.

Potassium Chlorate and Poliomyelitis.—Experiments performed by Saucier and Stewart, designed to repeat the work reported by Contat, Arthus, Spycher and Debat in which they claimed to have obtained evidence of a specific protective action from potassium chlorate against experimental poliomyelitis in monkeys, show to the contrary that potassium chlorate is of no value against the development or course of experimental poliomyelitis in monkeys.

Connecticut State Medical Society Journal, Hartford

3: 647-710 (Dec.) 1939

- The Litchfield County Medical Association and Dr. Elias Pratt. W. R. Steiner, Hartford.—p. 649.
Varieties of Healing Process in Tuberculosis of Spine. P. P. Swift, Hartford.—p. 652.
Rational Therapy. C. H. Wiles, New London.—p. 656.
Vaccines of Value. S. S. Chipman, Norwalk.—p. 658.
X-Ray Fallacies. B. M. Parmelee, Bridgeport.—p. 660.
Apical Cavity in Pulmonary Tuberculosis. R. G. Urquhart, Norwalk.—p. 663.
Sulfapyridine in Treatment of Pneumonia. F. G. Blake and J. W. Haviland, New Haven.—p. 665.
Horace Wells Conquers Pain: A 95th Anniversary Review. M. L. Soifer, Hartford.—p. 674.
*Clinical Significance of Bleeding of First Trimester of Pregnancy. F. C. LaBrecque, Waterbury.—p. 676.

Bleeding of First Trimester of Pregnancy.—LaBrecque says that examination of the records of 510 patients seen in the antepartum clinic of the Massachusetts Memorial Hospital reveals that only 17.2 per cent, or only eighty-eight women saw a physician for the first time during the first trimester of pregnancy. Moreover, 215 patients did not see a physician until the last trimester and twenty-four patients were not seen by a physician until they were at term. Despite the attention focused on antepartum care by the medical and lay press, patients are still seeing their physicians or visiting the maternity clinics much too late in pregnancy. About 40 per cent of all patients during the child bearing age have, at one time or another, bleeding as a complication during the first three months of pregnancy. Ti-

bleeding may be classified as (1) pseudomenstruation, (2) cervical (cervicitis, endocervicitis, erosion, polyp and carcinoma), (3) intra-uterine (abortion and hydatidiform mole) and (4) extra-uterine (ectopic pregnancy). The author concludes that carcinoma of the cervix does occur as a complication early in pregnancy and must be seriously considered when the bleeding is cervical in origin. The medical and lay press must continue education of the public regarding early antepartum care—which means the reporting of the patient to her physician within two weeks of missing a menstrual period. The causes of first trimester bleeding are classified and discussed as to diagnosis and treatment.

Indiana State Medical Assn. Journal, Indianapolis

- 33:1-54 (Jan.) 1940
Diagnosis and Treatment of Cardiovascular Emergencies ("Heart Attacks"). P. D. White, Boston.—p. 1.
Diagnosis and Treatment of Peptic Ulcer. R. L. Sensenich, South Bend.—p. 8.
Endotracheal Anesthesia. F. W. Clement, Toledo, Ohio.—p. 13.
Tularemia. R. E. Mitchell, Indianapolis.—p. 16.
Effect of Transportation on Rural Medicine. O. A. Province, Franklin.—p. 19.
Why People Go to Cultists. R. P. Knight, Topeka, Kan.—p. 22.

Journal of Experimental Medicine, New York

- 71:1-128 (Jan.) 1940. Partial Index
Chemical Studies on Bacterial Agglutination: Agglutinin and Precipitin Content of Antiserum to Haemophilus Influenzae, Type B. Hattie E. Alexander and M. Heidelberger, New York.—p. 1.
Selective Action of Sulfanilamide on Parasites of Experimental Malaria in Monkeys in Vivo and in Vitro. L. T. Coggeshall, New York.—p. 13.
Permeability of Human Placenta to Antibodies: Quantitative Study. A. S. Wiener and I. J. Silverman, with technical assistance of Eve Sonn, New York.—p. 21.
Soluble Antigen of Lymphocytic Choriomeningitis: II. Characteristics of Antigen and Its Use in Precipitin Reactions. J. E. Smadel, M. J. Wall and R. D. Baird, New York.—p. 43.
Studies on Experimental Hypertension: X. Oxygen Consumption of Ischemic Kidney. C. Gerbi, B. B. Rubenstein and H. Goldblatt, Cleveland.—p. 71.
Cardiac Lesions Resembling Aschoff Bodies in Rabbits. L. Loewe and S. E. Lenke, New York.—p. 89.
Studies on Eastern Equine Encephalomyelitis: IV. Infection in Mouse with Fresh and Fixed Virus. L. S. King, Princeton, N. J.—p. 95.
Id.: V. Histopathology in Mouse. L. S. King, Princeton, N. J.—p. 107.
Studies on Cultivation of Virus of Lymphogranuloma Venereum. M. Sanders, New York.—p. 113.

Journal of Immunology, Baltimore

- 37:507-610 (Dec.) 1939
Biologic Reactions of Malignant Neoplasms: I. Reaction to Bacterial Fractions. E. L. Walker and Marion Sweeney Handman, San Francisco.—p. 507.
Mechanism of Toxic Action of Germicides on Whole Blood Measured by Loss of Phagocytic Activity of Leukocytes. H. Welch, Washington, D. C.—p. 525.
Nature and Significance of Pseudo-Dick Reactions. R. W. Huntington Jr., St. Louis.—p. 535.
Allergy and Desensitization in Experimental Tuberculosis: Effect of Time and Dosage. C. E. Woodruff and H. S. Willis, Northville, Mich.—p. 549.
Protein Fractions of Strain of Group A Hemolytic Streptococci: III. Comparative Study of Phagocytosis and Digestion of Pneumococci by Macrophages and Polymorphonuclear Leukocytes in Normal and Immune Dogs. O. H. Robertson and Helen Van Sant, with technical assistance of Gladys Peterson, Chicago.—p. 571.

Pseudo-Dick Reactions.—In a search for a substance sufficiently potent to be considered a likely cause of pseudo-Dick reactions, Huntington states that filtrates of cultures of the hemolytic streptococcus contain little streptococcus protein, and the hypothesis which considers such protein a frequent source of pseudo-Dick reactions appears untenable. The activity of a filtrate of a nonscarlatinal streptococcus in the skin did not appear to depend on cellular disintegration and differed in its great heat stability and in other respects from that of preparations of streptococcus protein. No agent could be found, other than scarlatinal toxin, which had the potency necessary to induce reactions to one or two skin test doses of the scarlatinal filtrates used. On the whole, the results tend to suggest that at least in the age group studied (from 6 to 15 years) pseudo-Dick reactions to serum-free filtrate are unusual, and control filtrates heated for two hours at 100 C. should be of value in detecting them when they occur.

Journal-Lancet, Minneapolis

- 60:1-44 (Jan.) 1940
Prevention and Treatment of Contagious Diseases: Outline. A. V. Stoesser and Evelyn V. Johnson, Minneapolis.—p. 1.
The Student Health Service Physician. E. L. Shrader, St. Louis.—p. 5.
Thoracic Disease Giving Abdominal Signs and Symptoms. N. O. Brink, Bismarck, N. D.—p. 7.
Juvenile Cirrhosis: Case Report. Ruth C. Foster, Madison, Wis.—p. 11.
Importance of Adequate Scrotal Support: Preliminary Report. J. H. Winer, New York.—p. 13.
*New Type of Calcaneal Spur. J. R. Vasko, Great Falls, Mont.—p. 15.
Tuberculosis Problem in Negro Schools and Colleges. P. B. Cornely, Washington, D. C.—p. 17.
Results of Sulfanilamide Therapy in Treatment of Gonorrhea. W. Wright, Minneapolis.—p. 21.
Some Useful Prescriptions. B. Fantus, Chicago.—p. 25.
Artificial Fever Therapy by Physical Means. A. Stolinsky, Lisbon, N. D.—p. 29.
Treatment of Pneumonia in Children with Sulfapyridine. A. V. Stoesser, Minneapolis.—p. 33.
Prevalence of Vitamin A Deficiencies: Preliminary Report. E. O. Dahl, Minneapolis.—p. 36.

New Type of Calcaneal Spur.—Vasko directs attention to a type of spur formation on the posterior aspect of the os calcis, which to his knowledge has not been described before. He discovered such spurs on the posterior superior aspect of the os calcis at operation on two patients suffering from an achilles bursitis. The clinical aspects were those of an achilles bursitis consisting of swelling, aching, tenderness, and increased local temperature. Pressure of the shoe produced discomfort and walking was painful, especially climbing upward. Conservative treatment consisting of rest, immobilization and physical therapy proved unsuccessful and so after several weeks operative removal of the bursae was done. At operation the author found enlarged edematous bursae as was expected, but after their removal spur formations which were small, rough and sharp were found on the posterior superior aspect of the os calcis. These protruded as much posteriorly as superiorly. Obviously they constituted a rough surface over which the tendon had to slide and which probably caused the bursitis. Whether the spur or the bursitis came first is not known. The first case reported by the author reveals that recovery may occur without removal of the spurs. In this case the heels remained thickened posteriorly but were free from symptoms two years after the operation. In the second case the spurs were chiseled off, but the ultimate result is not known because the patient was not heard from again.

Journal of Nervous and Mental Disease, New York

- 91:1-140 (Jan.) 1940
Observations on Behavior of Schizophrenic Patients Undergoing Insulin Shock Therapy. C. Wall, Worcester, Mass.—p. 1.
Pick's Disease: Clinicopathologic Case Reports. S. M. Bouton Jr., Ingleside, Neb.—p. 9.
Grasping and Sucking. I. Bieber, New York.—p. 31.
Report of Familial Case. R. Richter, Chicago.—p. 37.
Remarks on Myelography. R. Wartenberg, San Francisco.—p. 47.
Cortical Atrophy or Tumor of Brain: Differential Diagnosis. A. Gordon, Philadelphia.—p. 53.

Journal of Nutrition, Philadelphia

- 18:537-638 (Dec.) 1939
Use of Isolated Radiation in Experiments with the Rat: II. Effects of Darkness, Visible and Infra-Red Radiation on Three Succeeding Generations of Rats: (a) Growth and Storage of Vitamin A. Ethel M. Luce-Clausen and Elizabeth F. Brown, Rochester, N. Y.—p. 537.
Id.: III. Effects of Darkness, Visible and Infra-Red Radiation on Three Succeeding Generations of Rats: (b) Reproduction. Ethel M. Luce-Clausen and Elizabeth F. Brown, Rochester, N. Y.—p. 551.
Adaptation to Low Calcium Intake in Reference to Calcium Requirements of Tropical Population. L. Nicholls and A. Nimalasuriya, Colombo, Ceylon.—p. 563.
Role of Antidermatitis Vitamin and New Water-Soluble Growth Factor in Nutrition of Mature Fowl. J. C. Bauernfeind and L. C. Norris, Ithaca, N. Y.—p. 579.
Quantitative Chemical Study of Urinary Excretion of Thiamin by Normal Individuals. D. Melnick, H. Field Jr. and W. D. Robinson, Ann Arbor, Mich.—p. 593.
Isolation of Desired Qualities of Radiant Energy for Biologic Experimentation. L. A. Jones and C. Tuttle, Rochester, N. Y.—p. 611.
*Determination of Ascorbic Acid in Commercial Milks. W. W. Woessner, C. A. Elvehjem and H. A. Schutte, Madison, Wis.—p. 619.

Ascorbic Acid in Commercial Milks.—Woessner and his associates determined the ascorbic acid content of regular commercial samples of milk as related to the quantity present in the milk at the time of milking. They found that samples of raw,

certified, certified Guernsey and certified vitamin D milks are, on the average, only a little below the fresh milks in ascorbic acid content, indicating that commercial raw and certified milks as delivered to the consumer lose only a small amount of their antiscorbutic potency. Likewise, samples of commercial pasteurized milks analyzed on an average contained only about half as much ascorbic acid as fresh raw milks and less ascorbic acid than the commercial unpasteurized milks. In pasteurized and unpasteurized milks the amount of dehydroascorbic acid was less than the ascorbic acid. Commercial pasteurized vitamin D milks in which the potency has been increased by incorporating vitamin D concentrates directly into the milk by homogenization fell below the average value of ordinary pasteurized milks with respect to the ascorbic acid content. On the other hand if the vitamin D content has been increased by feeding the animal irradiated yeast, the antiscorbutic property falls on a par with the average value for commercial pasteurized milks. This would indicate that homogenization tends to destroy ascorbic acid. Mineral modified milk is low in ascorbic acid.

Journal of Pharmacology & Exper. Therap., Baltimore

67: 373-494 (Dec.) 1939

- Integration of Vasomotor Responses in Liver with Those in Other Systemic Vessels. L. N. Katz and S. Rodbard, Chicago.—p. 407.
 *Effect of Vitamin B₁ on Morphine Abstinence Symptoms. O. G. Fitzhugh, Nashville, Tenn.—p. 423.
 Production of Anemia in White Mice by Sulfanilamide, Sulfapyridine and Diaminodiphenylsulfone. A. P. Richardson, Baltimore.—p. 429.
 Experimental Basis for Method for Quantitative Evaluation of Effectiveness of Chemotherapeutic Agents Against Streptococcal Infection in Mice. J. T. Litchfield Jr., H. J. White and E. K. Marshall Jr., Baltimore.—p. 437.
 Some Aspects of Pharmacology of Sulfapyridine. E. K. Marshall Jr. and J. T. Litchfield Jr., Baltimore.—p. 454.
 Detoxication by Finely Dispersed Oil-in-Water Emulsions and Their Intravenous Use. A. C. Frazer and V. G. Walsh, London, England.—p. 476.

Vitamin B₁ and Morphine Abstinence Symptoms.—The idea that morphine may increase the requirement for vitamin B₁, as alcohol does, and that the heightened irritability of the nervous system observed after withdrawal of morphine may be due to a deficiency of vitamin B₁ led Fitzhugh to study the effect of crystalline vitamin B₁ on the morphine abstinence symptoms of albino rats. He found that thiamin (for two days previous to and after withdrawal of morphine) not only decreased the irritability before the permanent withdrawal of morphine but also prevented the usual increase in irritability that follows morphine withdrawal. This effect was not due to any toxic action of the large doses of thiamin chloride used.

Maine Medical Association Journal, Portland

31: 1-34 (Jan.) 1940

- *Treatment of Asphyxia Neonatorum. P. J. Flagg, New York.—p. 1.
 Pyelitis in Pregnancy. T. M. Stevens, Portland.—p. 18.
 Postoperative Infections Following Abdominal Operations. G. A. Tibbetts, Portland.—p. 24.

Treatment of Neonatal Asphyxia.—From a study of the customary treatment of neonatal asphyxia in sixty-three obstetric teaching centers of the United States and Canada, Flagg finds that carbon dioxide with oxygen is in general use, that aspiration is regarded as essential and that the use of heat is frequently overlooked. This should always be applied to protect the baby from exposure. Sharp differences of opinion exist regarding the use of alpha lobeline and other drugs as respiratory stimulants. When intracranial hemorrhage is suspected, lumbar puncture is advocated and the injection of whole blood into the buttocks is recommended. Mouth to mouth insufflation is commonly employed as a method of artificial respiration when mechanical facilities are not available. Intracardiac injections are used as a last resort and are not popular. The use of blind intubation in accordance with the technic of de Lee is common practice in many clinics. The technic of direct laryngoscopy, intubation, suction and insufflation is not generally understood or applied when indicated. Confusion exists as to the sequence in which intracranial hemorrhage occurs; it is claimed as both a cause and a result of asphyxia. The baby that has shown signs of asphyxia should be carefully observed after it is returned to the nursery. The important question of atelectasis

is raised and the need of research is indicated. There is a strong sentiment in favor of popularizing to the profession and the public certain general information relative to neonatal asphyxia, with special feeling that frequent sedation administered to the mother is responsible for much of the neonatal asphyxia which is encountered and that the elimination or the reduction of this routine sedation will do much to prevent asphyxia.

Medical Annals of District of Columbia, Washington

8: 345-384 (Dec.) 1939

- *Surgical Treatment of Mental Disorders. W. Freeman, Washington.—p. 345.
 Significance of Blood Cholesterol Determinations. J. A. Lyon, Washington.—p. 354.
 Blood Changes Produced in Rabbits by Indole. W. T. Taylor, Washington.—p. 362.
 Proposed Phenolphthalein Test of Gastrointestinal Disease. F. D. Sutfenfield, Washington.—p. 363.
 Masking Effects of Sulfanilamide on Mastoiditis. D. Davis, Washington.—p. 365.

Surgical Treatment of Mental Disorders.—Freeman and his associate have modified the original Moniz surgical technic for the correction of mental abnormalities. Freeman finds that prefrontal lobotomy, carried out surgically, produces a certain change in the personality of the individual, characterized by a reorientation in the direction of extroversion and a reduction in introversion. It eliminates obsessive thinking, it reduces self-consciousness and it promotes satisfaction with self and surroundings. Fear of the future is no longer present. Following operation the patient behaves differently; his behavior seems to depend to some extent on his original makeup and to some extent on the amount of frontal lobe that is still in connection with the rest of the brain. The most satisfactory results from the operation are achieved in the obsessive-compulsive neuroses and in the involutional depressions with agitation. The results in chronic alcoholism have been negligible and those in the schizophrenias are still under consideration. Prefrontal lobotomy seems to offer something of value in the relief of intractable neuroses and psychoses.

Radiology, Syracuse, N. Y.

33: 681-808 (Dec.) 1939

- Clinical and Neurologic Aspects of Low Back and Sciatic Pain. M. N. Walsh, Rochester, Minn.—p. 681.
 Significant Skeletal Changes in Low Back and Sciatic Pain: Roentgenologic Observations. R. S. Bromer, Bryn Mawr, Pa.—p. 689.
 Air Myelography in Diagnosis of Intraspinal Lesions Producing Low Back and Sciatic Pain. W. E. Chamberlain and B. R. Young, Philadelphia.—p. 695.
 Intraspinal Lesions Associated with Low Back Pain and Sciatic Pain and Their Localization by Means of Lipiodol Within Subarachnoid Space. J. D. Camp and E. A. Addington, Rochester, Minn.—p. 711.
 Evaluation of Various Diagnostic Procedures Used in Study of Brachytherapy with Particular Reference to Roentgenographic Examination. H. B. Hunt and N. F. Hicken, Omaha.—p. 712.
 Relation of Ovarian Hormones to Benign Breast Hyperplasia and Neoplasia. M. Friedman, New York and Newark, N. J.; Rita Fiedler and W. Antopol, Newark, N. J.—p. 725.
 Carcinoma of Breast, with Consideration of Whole Organ Section Studies. E. R. Whitmore, Washington, D. C.—p. 737.
 Visceroperitonitis During Artificial Pneumoperitoneum Treatment. A. L. Banyai, Wauwatosa, Wis.—p. 751.
 Practical Considerations in Comparison of Depth Doses Achieved by 100 and 200 Kilovolt X-Ray Apparatus. P. C. Aebersold and M. A. Chaffee, San Francisco.—p. 759.

Virginia Medical Monthly, Richmond

67: 1-66 (Jan.) 1940

- Differential Diagnosis of Jaundice. F. M. Hanger Jr., New York.—p. 1.
 Present Status of Our Knowledge Concerning Pituitary Disease. J. E. Meredith, University.—p. 7.
 Medical Aspects of Acute Pyelitis. N. Bloom, Richmond.—p. 18.
 Treatment of Pyelitis. C. M. Nelson, Richmond.—p. 20.
 Incidence of Cervical Pain Associated with Renal or Ureteral Calculi. S. D. Failla and G. A. Watson, Durham, N. C.—p. 23.
 The Female Climacteric. E. C. Hamblen, Durham, N. C.—p. 24.
 Ulcers of Pyloric Sphincter, with Case Reports. G. W. Horsley, Richmond.—p. 29.
 Recent Developments in Gynecologic Endocrinology. J. A. Hertig, Newburgh.—p. 33.
 Placenta Accreta: Brief Survey of Literature, with Report of Case. J. H. Meyer and J. W. Ashworth Jr., Baltimore.—p. 36.
 Treatment of Gonorrhea in the Male with Sulfanilamide and Urethral Injections of Acriflavine. W. M. Brunet, C. H. Reinhardt and N. P. Shaw, Chicago.—p. 40.
 Eugenic Sterilization of the Epileptic and the Mentally Deficient. G. F. Arnold, Colony.—p. 45.
 Ectopic Pregnancy: Report of Fifty-Six Patients. R. L. Farnham, Durham, N. C.—p. 48.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Urology, London

11: 305-410 (Dec.) 1939

- *Observations on Healing of Renal Tuberculosis. R. Reid.—p. 305.
Prostigmine as Aid in Expulsion of Ureteral Calculi. V. J. O'Connor.—p. 325.
Episodes in Genito-Urinary Tuberculosis. T. Moore.—p. 332.
Tumors of Testicle: Report of Some Unusual Cases. M. B. Wesson.—p. 338.

Healing of Renal Tuberculosis.—Regardless of whether renal tuberculosis is secondary to some preexisting tuberculous lesion in the body, the bacilli must be conveyed to the kidneys by the blood stream and therefore Reid believes that it is illogical to assume that infection by this route is not evenly distributed and consequently bilateral. The passage of time and natural resistance may obscure the initial bilateral distribution in some cases by reason of healing in one kidney. The development of renal tuberculosis depends primarily on the degree of resistance of the organism to the infection. It does not appear to be dependent on any local abnormality in the kidney. However, it is influenced in its progress by the supervention of secondary septic infection. It is probable that obstruction and secondary infection hasten the destruction of the kidney but not necessarily of the individual. Five cases of bilateral disease are reported; in three there was evidence of tuberculosis outside the genito-urinary system, while in the remaining two tuberculosis occurred first in the epididymis and then in the kidneys. Once infection of the kidneys has occurred, development and spread of the disease is dependent primarily on the resistance of the body to tuberculosis. Thus, renal disease differs essentially in no way from other forms of systemic tuberculosis. Resistance is dependent on the patient's natural resistance, reinforced by the well recognized therapeutic measures. Of these measures constitutional treatment holds the first place. Lett has pointed out that urinary tuberculosis should be treated on the principles that apply to tuberculosis in general. His concept marks a step forward in the management of the disease in the urinary system. Whether the presence of tubercle bacilli in the kidney urine is an indication for nephrectomy is a question that requires further study. The number of bacilli in the kidney urine bears no relation to the extent of the lesion; only careful urologic survey can define how far the destruction has progressed. If operation is decided on it should be an incident in the course of constitutional treatment, which must be sufficiently prolonged to raise the patient's resistance to the highest possible level.

British Medical Journal, London

2: 1215-1260 (Dec. 23) 1939

- Hypertension: Consideration of Its Surgical Treatment. W. M. Craig.—p. 1215.
*Vitamin K Activity of 2-Methyl-1:4-Naphthoquinone and Its Clinical Use in Obstructive Jaundice. J. M. Macfie, A. L. Bacharach and M. R. A. Chance.—p. 1220.
Simplification of Technique in Peroral Endoscopy. V. E. Negus.—p. 1223.
Treatment of Gastrointestinal Achalasia by Spinal Anesthesia. E. D. Telford and H. T. Simmons.—p. 1224.
*Diphtheria Prophylaxis: Review of Antigens and Methods Available. J. T. Lewis.—p. 1226.

Vitamin K and Obstructive Jaundice.—The results of the use of 2-methyl-1:4-naphthoquinone as a synthetic substitute for natural vitamin K that Macfie and his associates report are striking. The preparation when given to four patients with obstructive jaundice with low prothrombin indexes raised the index in all of them within two days. In the last case the change was evident within twelve hours. It is probable that the effect was present in the other cases at this early stage but the index was not estimated sooner. The rapidity of its effect suggests that it may be particularly valuable in the treatment of postoperative bleeding in jaundice.

Diphtheria Prophylaxis.—Because of the lack of uniformity in the current processes adopted in this country for controlling diphtheria by active immunization, Lewis reports the following study: With three fortnightly doses of 1 cc. of toxin antitoxin mixture 99 per cent of 2,163 children originally Schick positive became Schick negative. Alum precipitated toxoid was given to 1,039 children, 760 of whom were originally Schick positive

and 279 were not given the Schick test previously. From eight to twelve weeks after the second injection 99 per cent of the 1,039 children were also Schick negative. The alleged tendency of alum precipitated toxoid to cause severe reactions was disproved by this study, as only forty-three of the children complained of discomfort. Thirty-five reactions were mild and occurred after the first injection of from 0.1 to 0.25 cc. of the toxoid and eight were severe, seven of which occurred after the first injection and one after the second injection. The results obtained by some workers with toxin antitoxin mixture and toxoid antitoxin floccules have varied widely, and those following the use of "one shot" alum precipitated toxoid have been so diverse as to make this method clearly untenable. All the reports of the use of two injections of alum precipitated toxoid are in accord with a consistently high Schick negative rate. Alum precipitated toxoid by two injections should have a more accredited place in immunization schemes. This method is now employed in more than 40 per cent of the studies investigated by the author.

Journal of Laryngology and Otology, London

54: 691-774 (Dec.) 1939

- Acute Osteomyelitis of Superior Maxilla in Young Infants. N. Asherson.—p. 691.

Journal of Physiology, Cambridge

97: 133-272 (Dec.) 1939. Partial Index

- Impulses in Pyramidal Tract. E. D. Adrian and G. Moruzzi.—p. 153.
Effect of Anterior Pituitary Extracts on Insulin Content of Pancreas. C. H. Best, J. Campbell and R. E. Haist.—p. 200.
Afferent Impulses from Teeth Due to Pressure and Noxious Stimulation. C. Pfaffmann.—p. 207.
Afferent Impulses from Teeth Resulting from Vibratory Stimulus. C. Pfaffmann.—p. 220.
Vascular Changes Affecting Transmission of Nervous Impulses. Edith Bülbring and J. H. Burn.—p. 250.
Amine Oxidase and Adrenalin. D. Richter and A. H. Tingey.—p. 265.

Lancet, London

2: 1299-1352 (Dec. 23) 1939

- Dark Adaptation Test: Its Reliability as Test for Vitamin A Deficiency. L. J. Harris and M. A. Abbas.—p. 1299.
*Relief of Intractable Pain in Carcinoma of Cervix Uteri. T. F. Todd.—p. 1305.
Strangulated Hernia. J. B. Hume.—p. 1308.
Sulfapyridine in Saliva. B. W. Fickling, P. Pincus and B. Boyd-Cooper.—p. 1310.
Perforated Peptic Ulcer: Analysis of 100 Consecutive Cases. A. H. Sangster.—p. 1311.
*Epidemic of Apparent Influenza. A. E. Martin and R. W. Fairbrother.—p. 1313.

Relief of Pain in Carcinoma of Cervix.—Two years ago Todd pointed out that two types of pain, visceral and somatic, were experienced in advanced carcinoma of the cervix uteri and that they could be differentiated clinically. The author investigated thirty-three cases: fifteen of visceral pain and eighteen of somatic. The treatment advocated was presacral neurectomy for visceral pain and intrathecal injections of absolute alcohol for somatic. When the appropriate method was used, the percentage of success was high. In the subsequent two years the author has continued this research in a further series of fifty-five cases. He now presents his observations on this second series. In investigating the cases a careful history and description of the pain is taken, a neurologic examination is made, examination under anesthesia, cystoscopy, sigmoidoscopy and exclusion of pyometra are done and roentgenography of the lumbosacral spine and pelvis and pyelography complete the investigation. Then an assessment is made of the type of pain and of the nerve path concerned. The author regards pain of sufficient severity to prevent sleep unless sedatives are administered as the most reliable indication of intractability. A week or even longer may be necessary for deciding whether the pain is minimal and the patient over-reacting to it. He is convinced that it is most important to have a precise objective phenomenon, such as interference with sleep, when attempting to assess and treat patients alleged to have severe pain. As regards visceral pain, the commonest cause is ulceration of the rectum, malignant involvement of the base of the bladder, or pyometra. As before, either direct local therapy or presacral neurectomy has almost always given relief. In cases associated with an advancing malignant process an alternative therapy to presacral neurectomy consists in injections of alcohol so administered as to

affect the upper lumbar roots, and the author thinks this will replace neurectomy in the malignant cases. Intrathecal injections of alcohol have been given in twenty-eight further cases of somatic limb pain. It could be confirmed that intrathecal injection of absolute alcohol is a valuable agent for the relief of intractable pain. The average duration of relief was three months. Two patients are still alive, having been treated over two years ago, and the relief has persisted, though in one the pain is beginning to recur. In conclusion it is stated that relief of intractable pelvic and lower limb pain associated with advanced cancer should be achieved satisfactorily in nearly 90 per cent of the cases. Failure to achieve relief probably indicates a technical imperfection or the presence of cord compression or is due to drug addiction. Changes in the nerve roots and spinal cords found at necropsy in two cases are recorded, and it is emphasized that injections of alcohol should be given only in the presence of malignant disease.

Epidemic of Apparent Influenza.—Martin and Fairbrother investigated seventy cases of apparent influenza which occurred during a mild epidemic in January and February 1939. Although in certain respects the outbreak resembled epidemic influenza, the evidence for concluding that the epidemic was not caused by the influenza virus is reasonably convincing. The virus was not isolated in typical cases by a technic which had succeeded on other occasions, and there was no increase in antibody titer of the serums of convalescent patients tested by complement fixation. The symptoms were, on the whole, uniform and simulated those of epidemics caused by the influenza virus. This tendency to uniformity suggests that probably one etiologic agent was responsible. It seems equally clear that this agent was not the influenza virus nor could a bacterial cause be demonstrated. The probability thus appears to be that the 1939 epidemic was caused by a virus which has not yet been isolated. The reactions obtained in some of the ferrets inoculated with material from such cases lends support to this view. It may be difficult clinically to differentiate cases of infection with the influenza virus from those caused by some other agent. Moreover, the high contagiousness and rapid spread of infection, even in a localized group, cannot be taken as a sure indication of the participation of the influenza virus in the outbreak. The investigation of this epidemic clearly establishes the necessity to search further for viruses other than the influenza virus which may be responsible for infections of the upper respiratory tract that occur in epidemic form and simulate clinical influenza.

Medical Journal of Australia, Sydney

2: 887-920 (Dec. 16) 1939

- *Comparative Study of Rickettsial Strains from Infection of Ticks in Montana (United States of America) and from Q Fever. F. M. Burnet and Mavis Freeman.—p. 887.
- Review of Physical Condition of 130 Returned Soldiers Suffering from Effort Syndrome. R. Whishaw.—p. 891.
- Place of the Medical Man in the Preparation of an Army for War. E. L. Cooper.—p. 893.
- Susceptibility to Diphtheria and Poliomyelitis. W. G. Henslip.—p. 899.
- Some Observations on Sciatica. N. Little.—p. 901.

2: 921-952 (Dec. 23) 1939

- Some Backgrounds in Medicine. L. S. Latham.—p. 921.
- Pyelitis, Medical Aspects. K. Maddox.—p. 927.
- Pyelitis and Pyelonephritis from the Surgical Point of View. M. S. S. Earlam.—p. 931.
- Place of Cesarean Section in Treatment of Placenta Praevia. A. J. Gibson.—p. 934.

Comparison of Rickettsial Strains of Ticks in Montana and Q Fever.—Burnet and Freeman find that the rickettsia isolated from ticks in Montana by Davis and Cox and from a laboratory worker by Dyer is immunologically indistinguishable from the rickettsia of Australian Q fever. The American strain, like the Australian strain, is pathogenic for guinea pigs, mice and two species of monkeys. It is of greater virulence for all three species, and if a large enough dose is administered it produces a fatal infection in guinea pigs. The authors believe that the two types should be included in the same species.

Tubercle, London

21: 41-80 (Nov.) 1939

- Tuberculosis in Burma. S. L. Cummins.—p. 41.
- Investigation of Value of Various Mediums for Primary Culture of Tubercle Bacilli from Tuberculous Material. E. Piasecka-Zeyland.—p. 56.

Annales de Dermatologie et de Syphiligraphie, Paris

10: 737-832 (Sept.) 1939

- Tissular Diastases of Liver and Thyroid in Treatment of Eczema of Dogs. F. Maignon.—p. 737.
- *Contribution to Clarification of Etiologic Problem of Induratio Penis Plastica. J. May.—p. 745.
- Arsenical Encephalopathy. A. Tzanck and S. Lewi.—p. 752.
- *Continuous Treatment of Pemphigus by Mercury Bichloride. E. Sonnenberg.—p. 771.

Etiology of Induratio Penis Plastica.—May directs attention to the possibility of finding a positive intradermal Frei reaction in cases of induratio penis plastica. He reviews a case presenting a sclerogenic process and lymphatic infiltrations on the dorsum of the penis, in which he first resorted to the Frei test. The reaction was positive and so the author decided to institute antigenotherapy against venereal lymphogranuloma. From the first injection the symptoms began to subside, the viscous secretion dried up quickly, the lymph nodes rapidly decreased in size and the induration of the corpus cavernosum receded slowly. The author cites additional cases observed by himself or by others. Until December 1938 he was able to collect forty-three cases; in thirty-eight of these the Frei reaction was positive and in five it was negative. He does not believe that venereal lymphogranuloma is the only etiologic factor of induratio penis plastica, which probably can be produced also by other infections. However, he thinks that venereal lymphogranuloma is the etiologic factor of induratio penis plastica in a comparable percentage of cases as it is the cause of rectal stricture.

Mercury Bichloride in Pemphigus.—In an extensive report, Sonnenberg reviews a case of pemphigus which was complicated by secondary infection. To counteract the offensive odor given off by the patient, which was probably caused by the presence of *Staphylococcus pyogenes aureus*, and because he had found intramuscular injections of mercury bichloride helpful in cases of furunculosis, he decided to resort to injections of mercury bichloride. The injections were given daily. During the first two weeks of this treatment the bullae became more transparent, the odor diminished, the skin became drier and islands of epidermis commenced to reappear. Later the patient's general condition improved; the appetite as well as the weight increased. Toward the seventh week of the application of mercury bichloride the last visible symptoms gradually disappeared. The favorable effects obtained with mercury bichloride in this case induced the author to employ it in other cases of pemphigus. Since 1932 he has used it in thirty-four cases of pemphigus; fourteen of the patients were men and twenty were women. The ages of the patients varied between 8 and 71. Chronic pemphigus vulgaris existed in twenty-four cases, pemphigus foliaceus in four and pemphigus vegetans in six. In twenty-four cases the first symptoms appeared on the mucous membranes, in ten on the skin. Ocular complications existed in twenty-two cases and enucleation of an eye became necessary in one case. Dystrophic deformations of the nails were encountered in fourteen cases. In three cases complete loss of hair was observed. The symptomatology varied considerably, although certain conditions were always found. Following a discussion of the theoretical justification of the use of salts of mercury in the treatment of pemphigus, the author raises the question as to what should be done after the termination of the acute phase of pemphigus and then describes his conception of the continuous treatment with mercury bichloride. Reports of cases in which the continuous treatment was employed indicate that the maintenance treatment with mercury bichloride consisted of one injection every week or every second week. Interruptions of these injections were followed by relapses which necessitated renewed hospitalization. In some cases the maintenance treatment was continued for several years.

Archives de Médecine des Enfants, Paris

42: 673-792 (Nov.-Dec.) 1939

- Avitaminosis and Notion of "Terrain" (Especially in Their Relation with Dystrophies in Children). G. Mouriquand.—p. 673.
- *Vitamin A in Treatment of Typhoid in Children. P. Girard and A. Vallette.—p. 691.
- Xerophthalmia and A-Avitaminosis. R. Clement and J. Delon.—p. 694.

Vitamin A in Treatment of Typhoid in Children.—Because patients with typhoid behave clinically like subjects with deficiency in vitamin A and because from the onset of typhoid the patients present biologic signs that accompany in-

iciency of vitamin A, Giraud and Vallette reasoned that the administration of vitamin A might be of value in patients with typhoid. They administered vitamin A to patients either in the form of cod liver oil with at least 2,000 units per cubic centimeter in doses of from ten to twenty drops a day or by utilizing an injectable solution, standardized at 3 per cent of the active products, injected intramuscularly in doses of 0.25 cc. every two days. They employed vitamin A in seventy-one cases of typhoid. They admit that the general course of the disease is not greatly changed by this medication; nevertheless, the time required for cure seems to be somewhat shorter than usual. Furthermore, the general prognosis is more favorable, because the mortality rate in the cases treated with vitamin A was only 11 per cent whereas in comparable cases treated without vitamin A it was about 20 per cent. Cardiac and cutaneous complications have been less frequent and more benign; however, pulmonary, hepatic or nervous complications apparently have not been modified. The intestinal hemorrhages have been completely averted. Thus it is certain that the vitamin A exerted a favorable effect on the nutrition of the intestinal lining. The authors recommend the systematic employment of this treatment in the course of typhoid.

Journal Belge de Neurol. et de Psychiat., Brussels

39: 715-782 (Nov.) 1939

- Visibility of Cystic Cavities of Cerebral Neoplasms by Means of Injections of Thorium Dioxide Sol. T. de Lehoczy.—p. 715.
Afferent Passages of Inferior Olivary Body. M. A. Gerebtzoff.—p. 719.
Toxic Polyneuritis Induced by Ulliron. A. Leroy.—p. 729.
*Treatment of Migraine by Intramuscular Injections of Pentamethylene-tetrazol. A. Leroy.—p. 735.
Projection of Anterior Nuclei of Thalamus into Interhemispheric Cortex. J. Stoffels.—p. 743.

Metrazol Therapy in Migraine.—Leroy reports three cases of migraine in which metrazol was successfully applied intramuscularly in doses varying, preferably, between 0.25 and 0.3 Gm. in a 10 per cent solution. One of the patients, aged 63, had suffered from migraine for fifty years. His attacks would occur every ten days together with violent headaches, vomitings and insomnia. Sixteen injections of from 0.2 to 0.3 Gm. were given during a period of four months, followed by a single injection of 0.3 Gm. about two months afterward. At the end of a further period of four and one-half months the migraine appeared only at monthly intervals in an attenuated form of light headache, sometimes accompanied with vomiting. The condition of another patient, aged 35 years, with anamnesis of migraine in the mother, dated back to only a few years. He was subject to monthly attacks, sometimes lasting two weeks, with the usual signs. A severe dietary regimen was unavailing. Four intramuscular injections of from 0.2 to 0.25 Gm. of metrazol were sufficient to cure the disease, correct constipation and normalize nutrition. The disease of the third patient, aged 42 years, also with anamnesis of migraine in the mother, had a background of neurasthenia, debility, tachycardia and marked anemia. Crises of migraine occurring once a week and increasing in violence set in, a year before treatment, with nausea and vomiting. The administration of fourteen injections usually of from 0.2 to 0.25 Gm. of metrazol progressively reduced the symptoms. Three months later the patient was feeling well and had had only one or two slight attacks. The author attributes the efficacy of metrazol in migraine to shock induced by the intramuscular administration of the drug but invites further study.

Confinia Neurologica, Basel

2: 321-380 (No. 6) 1939

- Anatomoclinical Study of Stricerebellar Tremor with Bradykinesia (P. Marie-G. Levy) and with Cholesterosis of Spleen and Choroid Plexus. G. de Morsier and L. van Bogaert.—p. 321.
*Further Studies Concerning Role of Radicular Nerves in Human Tetanus. L. Benedek and A. Juba.—p. 345.
Regulatory Influence of Sympathetic on Brain Centers. L. Asher and N. Scheinfinkel.—p. 356.
New Trigeminal Reflex (Trigemintympanic Reflex) on Basis of Self Observation. F. Zak.—p. 368.

Role of Radicular Nerves in Human Tetanus.—Benedek and Juba in an earlier report described the histopathologic aspects of ten cases of tetanus. In this paper they give an account of studies in four additional cases. The presence of contusions or wounds provided the prerequisites for the invasion of the anaerobic tetanus bacilli, and symptoms like lockjaw, stiffness of the neck and rigidity of the musculature were so

pronounced in all four cases that the diagnosis could not be doubted. The histologic aspects in the first two cases were especially varied, in the third case negative and in the fourth case uncommonly extensive. In the first two cases the infiltrations of the radicular nerves, consisting chiefly of lymphocytes and leukocytes, were so considerable that in some places the connective tissue framework was completely filled by them. The radicular nerves presented the most serious changes, although in case 1 there existed an extensive and in case 2 a localized infiltration of the pia mater. There seems to exist a correlation between the duration of the disease and the histologic picture. In case 1 the disease lasted four days. The infiltrations, located in the radicular nerves and in the pia mater, were grave. In case 2, in which the disease lasted eight days, the infiltrations were less extensive, existing chiefly in the radicular nerves. In case 3, which had lasted ten days, no histologic changes were observable. All this confirms the opinion which the authors had expressed previously, that the gravity of the infiltration depends chiefly on the duration of the disease. Case 4, however, apparently is a contradiction, for in spite of its long duration (seventeen days) there remained sparse infiltrations in the fibrous sheaths of the radicular nerves and severe infiltrations in the pia mater. In all probability the infection in this case was particularly virulent. In this new series of cases, as in the earlier one, the lesions of the cells of the intervertebral ganglions were more severe than those of the motor elements of the spinal cord. The swelling of the axis cylinders of the radicular nerves was also common, while the myelin sheaths proved unimpaired in the authors' cases. They think that the infiltrations in the nervous system, particularly those in the connective tissue of the radicular nerves, are a manifestation of the increased activity of the reticulo-endothelial apparatus of the central nervous system.

Pediatrics, Naples

47: 1005-1049 (Dec.) 1939. Partial Index

- Congenital Nodular Syphilis of Lung: Anatomopathologic Study. M. Raso.—p. 1005.
*Sclerosis Tuberosa: Four Cases with Encephalography. R. Ruggeri.—p. 1040.

Sclerosis Tuberosa.—Ruggeri calls attention to the importance of sclerosis tuberosa from a pediatric point of view. He observed eight cases of the condition in institutions for children with mental deficiency. Four cases are reported. The disease was characterized by the typical symptoms (epilepsy, mental deficiency or idiocy, alterations of the skin or else leukoderma and Pringle's adenoma) in three cases. Epilepsy developed during the first months of life of the patients and it had resisted prolonged treatment with phenobarbital or bromides. The neurologic symptoms were scanty. One of the two patients who suffered from divergent strabismus showed a bilateral Babinski reflex. A patient had congenital luxation of the hip joint and valgus foot. The fourth patient showed all the typical symptoms but epilepsy. He had Pringle's adenoma and also Barlow's sebaceous adenoma of the scalp. In all four cases the blood, cerebrospinal fluid and urine were normal. The fundus of the eye was grayish during ophthalmoscopic examination in one case. Encephalography was performed in all cases. It gave normal encephalograms in two cases. In one case of the typical form it showed deformation and dilatation of the right ventricle, which was more acute when encephalography was repeated two years later. In the case presenting the atypical form of the disease encephalography showed deformation and dilatation of the lateral ventricles and the presence of growing tumors (lack of air filling) in the ventricles. The author emphasizes the importance of encephalography for the diagnosis of sclerosis tuberosa, especially in atypical forms of the disease.

Endokrinologie, Leipzig

22: 225-304 (Oct.) 1939

- The Pars Intermedia of the Hypophysis in Man. W. Berblinger.—p. 225.
The Status Thyro-Adrenalis (M. B. Schmidt). H. Kothe.—p. 229.
*Diabetes Mellitus and the Hypophysis-Thalamencephalon System. G. Köhne.—p. 241.
Acromegaly and Nephritis: Case. K.-H. Riwooldt.—p. 255.

Diabetes Mellitus and the Hypophysis-Thalamencephalon System.—Köhne made postmortem examinations in twelve cases of diabetes. Special attention was paid to the hypophysis-thalamencephalon system. Changes were observed

in the pancreas in all cases, such as island atrophy, sclerosis, lipomatosis or inflammatory processes. In one case with acromegaly an eosinophil cell tumor of the anterior lobe of the hypophysis occurred. In one case of apparently extra-insular origin, necrosis in the anterior lobe of the hypophysis was observed. The author points out that the one sided conception of a central genesis of diabetes is too narrow and does not do justice to the complicated course of carbohydrate metabolism carried out by the synergistic action of several endocrine organs. However, this does not mean denying glycosuria of central origin. The author concludes that the cause of classic diabetes does not lie primarily in the hypophysis-thalamencephalon system.

Medizinische Klinik, Berlin

35: 1529-1560 (Dec. 1) 1939. Partial Index

Estimation of Functional Capacity of Heart. E. Wiechmann.—p. 1535.
Induction of Birth in Case of Retarded Onset of Labor. F. Engelmann.—p. 1538.

Indications for Blood Transfusion in Internal Medicine. U. Wetzel and Maria Watz.—p. 1541.

*Treatment of Asthenic Conditions with Desoxycorticosterone Acetate. H. Eitner.—p. 1544.

Desoxycorticosterone Acetate in Asthenic Conditions.—Eitner tried desoxycorticosterone acetate in 0.5 per cent oily solution in cases of asthenia with severe emaciation. The patients were given daily one intramuscular injection of 1 cc. of the oily solution, that is, 5 mg. of the drug. The nine cases reviewed were characterized by general debility, weakness and loss of weight. The total quantities of desoxycorticosterone acetate administered in these cases varied between 0.075 and 0.26 Gm. In some cases the treatment was limited to the administration of desoxycorticosterone acetate and the resulting increase in weight was rapid and continuous. In other cases the drug was given after the insulin-dextrose therapy had produced unsatisfactory results and here again the desoxycorticosterone acetate proved effective. The increase in weight that followed treatment with desoxycorticosterone acetate was accompanied by an improvement in the general condition and in the subjective complaints. It is important that the organism receive an adequate supply of foodstuffs but forced feeding is unnecessary. The fact that the administration of the drug succeeded in cases in which the customary methods failed suggests that insufficiency of this substance existed although the characteristic symptoms of Addison's disease were absent. On the other hand, there are cases of emaciation in which desoxycorticosterone acetate fails to act in this manner. The author hopes that further investigations on the resorption of fat and dextrose may perhaps make possible a more exact indication for the use of the preparation than was possible on the basis of merely clinical observations.

Zeitschrift für Hygiene und Infektionskr., Berlin

122: 125-248 (Oct. 21) 1939. Partial Index

Contribution to Measurement of Noise with Improved Noise Counter (Thorybometer) of Dold and Thiele. H. Thiele and K. Holzberg.—p. 125.

Relations Between Severity of Infection and "Clinical Picture" in Infections with *Chilomastix Mesnili* and Other Flagellates of Large Intestine. A. Westphal.—p. 146.

Experiments on Elimination of Vaccine Virus by Lymphatic Organs of Intestine of Rabbits with Special Consideration of Appendix in Connection with Problem of Biologic Function of Tonsils. P. Roth.—p. 159.

*Harmfulness of Aluminum Dust in Case of Respiratory Intake. O. Ehrismann.—p. 166.

Influence of Manganese on Body Weight and Propagation. O. Ehrismann.—p. 171.

*Duration of Immunity Against Diphtheria. J. Sigurjónsson.—p. 189.
Studies on Nutrient Mediums for Diphtheria Bacilli and Types of Diphtheria. B. Warnecke.—p. 199.

Resistance of Gray and White Mice Against Infection with Bacterium *Ozaenae*. F. Freytag.—p. 211.

Respiratory Intake of Aluminum Dust.—According to Ehrismann, aluminum which is taken in through the gastrointestinal tract is not harmful in the quantities which occur under ordinary conditions. In this report he considers the respiratory intake of aluminum dust. He describes observations on rabbits and guinea pigs, which for periods of many weeks were exposed daily for six hours to the inhalation of dust consisting of aluminum-bronze. Pathologic conditions were observed in none of these animals. It was observed that guinea pigs developed pneumonia after the inhalation of comparatively small quantities of lead oxide dust. Studies on the

quantity of aluminum in the lungs revealed that slightly larger quantities were present in the lungs of the animals exposed to the aluminum dust than in those of the controls. Further experiments will be necessary to determine whether aluminum is absorbed by the pulmonary surface and is transported to other organs, although this appears improbable. The reported observations provide further proof of the harmlessness of aluminum even if it acts in the form of a dust on the upper and deeper respiratory passages. Large quantities of dust may cause annoyance and catarrhal reactions, but severe impairments and lesions that are specific for aluminum are not to be expected.

Duration of Immunity Against Diphtheria.—Sigurjónsson reports that diphtheria, which ordinarily is comparatively rare in Reykjavik, Iceland, increased during 1935 and protective immunization was employed for the first time on a large scale. In 1939 Schick tests were made on the school children to determine what degree of protection was still in existence four years after the immunization. Children between 7 and 12 who had not been immunized gave negative Schick tests on the average in 10.4 per cent of the cases. Comparison with the preliminary tests in 1935 disclosed that the immunity among the nonimmunized is about the same as it was at that time. Of 867 children who four years ago had been given two injections of toxoid that had been precipitated with aluminum hydroxide, 66.3 per cent were still Schick negative. Eight months after the immunization 95.4 per cent were negative. Of 483 children who had been given only one injection of the same toxoid, only 19.5 per cent were now Schick negative, and of 134 who were immunized by two injections of Ramon anatoxin that had been treated with formaldehyde, 26.12 per cent were Schick negative. Eight months after the immunization 80.7 per cent of this group were negative. A transition from a Schick-negative to a Schick-positive reaction took place in the course of four years in forty-six of 181 children (25 per cent) who had received two injections of the toxoid precipitate, in sixty of eighty-eight children (62.2 per cent) who had been given two injections of anatoxin treated with formaldehyde and in fourteen of twenty-eight children (50 per cent) who had become negative by latent infection. The author concludes that in Reykjavik the Schick immunity acquired naturally by children is weak and usually is temporary. The immunity obtained by inoculation was likewise of short duration in many cases. In the presence of such immunity conditions a single immunization is not enough for an effective prophylaxis of diphtheria. The Schick test is entirely adequate for epidemiologic purposes.

Ugeskrift for Læger, Copenhagen

101: 1467-1494 (Dec. 14) 1939

Insulin Shock Treatment, Its Basis and Physiologic Action. G. Madsen.—p. 1467.

*Treatment of Epidermophyton Infection with Copper Iontophoresis. O. Jersild and Marie Plesner.—p. 1475.

Treatment of Epidermophyton Infection with Copper Iontophoresis.—Jersild and Plesner discuss seventy-nine cases of this infection treated since their first report on copper iontophoresis treatment. In sixty-six cases the disease was localized to the feet, in twelve to the hands and in one to the genitalia. In most of the cases the duration had been several months, in some, years. As a rule one or two treatments were effective, and in most cases an average of five to six treatments sufficed; in a few instances ten or twelve treatments were necessary. Sixty-nine patients were discharged completely cured, eight still presented slight desquamation on discharge, and two left before ending treatment. No after examinations have been made because of the difficulty in distinguishing between recurrence and reinfection.

101: 1523-1534 (Dec. 28) 1939

*Frequency of Pernicious Anemia in Aged. E. Kirk and H. Geert-Jørgensen.—p. 1523.

Case of Exanthem from Mercury. H. Boas.—p. 1525.

Frequency of Pernicious Anemia in Aged.—From the examinations of 2,079 persons aged from 60 to 96 in various parts of the people's homes, Kirk and Geert-Jørgensen conclude that the frequency of pernicious anemia among old persons in Denmark is between 0.75 and 1 per cent.

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THE DIAGNOSIS AND TREATMENT OF CARDIAC EMERGENCIES

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Among the most alarming of the medical emergencies are those arising from acute conditions within the heart. Immediate treatment is frequently imperative. Fortunately, there are a half dozen drugs used in cardiac emergencies which are now available in sterile solution in single dose ampules, convenient for immediate hypodermic administration. These drugs belong in the kit of every physician. Their proper administration to achieve an optimum therapeutic effect and the emergency conditions which demand their use should be common knowledge.

CARDIAC ARRHYTHMIAS

Probably in no cardiac emergency does death seem more instantly impending than in the Adams-Stokes syndrome. If the ventricles cease to pulsate for as long as eight or ten seconds, cerebral anemia results and the patient suddenly loses consciousness. If the ventricles remain in diastole for more than fifteen seconds, the Adams-Stokes syndrome appears with convulsive seizures accompanying the syncope. The ventricular standstill, if untreated, may continue until sudden death occurs. The diagnosis is not difficult when the patient is seen in an attack. The abnormally slow heart rate, or the absence of the apex beat, and the rapid venous pulsations in the neck due to the uninterrupted auricular action, distinguish it. The syndrome may appear at the onset of complete heart block or when there is a sudden change from partial to complete heart block. It appears occasionally in acute coronary thrombosis when the infarction involves the conduction system. Two such cases have recently come under my observation, one ending fatally.

As an emergency measure in the treatment of a prolonged attack of ventricular standstill, epinephrine hydrochloride (adrenalin chloride) should be injected directly into the heart. A $2\frac{1}{2}$ inch (6 cm.) 22 gage needle may be inserted into the fourth left interspace about 2.5 cm. from the sternal border. From 0.5 to 1.5 cc. of a 1:1,000 solution of epinephrine hydrochloride may then be injected into the ventricular wall or cavity. There is some dispute as to whether it is desirable to inject the drug into the region of the sino-auricular node. During the less severe attacks of convulsive syncope or when the attacks are recurring, from 0.25 to 1 cc. of a 1:1,000 solution of epinephrine

should be injected subcutaneously every few hours for as long as is necessary to maintain a heart rate of over 30 beats per minute. The drug stimulates ventricular irritability and shortens the period of diastole. It has an immediate, but not a prolonged, effect. Ephedrine, barium chloride and atropine sulfate have been used to control Adams-Stokes seizures, but they have not produced as uniform results as has epinephrine.

A rapid ventricular rate, approaching 200 beats per minute, if prolonged, will at times induce alarming symptoms in persons without organic heart disease. Palpitation, dyspnea, vertigo, syncope and severe precordial pain may result. When a rapid ventricular rate is superimposed on organic heart disease such as mitral stenosis or aortic regurgitation, acute congestive heart failure may supervene and if the ventricular rate is not decreased it may cause death.

If the rapid beating of the ventricles is due to paroxysmal auricular tachycardia originating in the sinus node, the attack may occasionally be terminated by vagus pressure. If this procedure does not immediately reduce the ventricular rate, acetyl-beta-methylcholine hydrochloride (mecholy) should be administered subcutaneously. The optimum dosage varies with the age and weight of the patients, one-sixth to one-third grain (0.01 to 0.02 Gm.) being sufficient for young or light weight patients and one-half to 1 grain (0.03 to 0.06 Gm.) being necessary for elderly or obese persons. In a majority of cases the heart will resume its normal rate within fifteen minutes. If it does not do so within two minutes, the site of the injection may be massaged to hasten absorption. If this is not effective, carotid pressure may be applied while the drug is still active.¹ If the initial dose does not check the rate, a second dose may be administered after the lapse of twenty or thirty minutes. Because the drug produces marked stimulation of the parasympathetic nerves, the patient, to avoid fainting, should be lying down during and immediately after the injection. Disagreeable symptoms such as flushing, salivation, profuse perspiration, nausea, vomiting and occasionally dyspnea, precordial pain or collapse may accompany the action of the drug. These symptoms, if alarming, can be instantly checked by the intravenous administration of atropine sulfate $\frac{1}{100}$ grain (0.0006 Gm.). The use of the drug is contraindicated in cases of bronchial asthma and in cases of arteriosclerosis with hypotension, angina pectoris or recently healed myocardial infarction. It is usually not effective in cases of tachycardia in which the rapid ventricular action is produced by ectopic stimuli.

In all cases of paroxysmal ventricular tachycardia as well as in those cases of paroxysmal auricular tachycardia in which mecholy is either contraindicated

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1. Starr, Isaac, Jr.: Acetyl- β -Methylcholin: IV. Further Studies of Its Action in Paroxysmal Tachycardia and in Certain Other Disturbances of Cardiac Rhythm, *Am. J. M. Sc.* 191: 210-224 (Feb.) 1936.

or not effective, quinidine sulfate should be given orally, from 3 to 6 grains (0.2 to 0.4 Gm.) every two hours for six or more doses. I have frequently given up to 45 grains (3 Gm.) of quinidine sulfate during a twenty-four hour period without its having produced untoward effects. However, when massive doses of this drug are to be used it must be fully understood that the patient should first be tested for quinidine idiosyncrasy. If the drug is tolerated, the patient should remain under observation, at rest in bed, during the course of treatment. Electrocardiograms should be taken at intervals in order to note any toxic effect of the quinidine appearing in a prolongation of the conduction time, which would call for the discontinuance of the drug.

In the treatment of paroxysmal auricular fibrillation the use of quinidine sulfate is specifically indicated. Quinidine, unlike meclocholyl, does not slow the heart rate by a vagal effect but acts directly on the heart muscle, decreasing its irritability and conductivity and prolonging the period of diastole. Its administration is contraindicated in cases of long standing or permanent auricular fibrillation because of the possibility that with the restoration of normal auricular pulsation portions of mural thrombi might be detached and be carried into the circulation. When the ventricular rate is accelerated in a case of chronic auricular fibrillation, digitalis should be administered in sufficient amounts to slow the rate.

In paroxysmal auricular flutter, digitalis therapy will change the flutter to auricular fibrillation in about 50 per cent of the cases. The withdrawal of the digitalis may then be followed by a spontaneous cessation of the fibrillation. If this procedure is not successful, the administration of quinidine sulfate may restore a normal rhythm.

DIGITALIS

The most generally accepted method of digitalis therapy is the oral administration of standardized powdered digitalis leaves in tablets of $1\frac{1}{2}$ grains (0.1 Gm.). As to the value of using digitalis preparations other than the standardized powdered leaf, I am in hearty agreement with Christian's² statement: "Tincture of digitalis may be substituted in mouth dosage for the powdered leaves if for any reason that seems desirable; rarely, however, in my experience is that the case; if for no other reason, the convenience of pills and capsules would give a preference to powdered leaves over the tincture; however, it has always seemed to me that the whole leaf has a therapeutic superiority to the alcohol soluble portions present in the tincture. . . . At present there is no advantage to be obtained by using any other than Pharmacopeial preparations of digitalis, notwithstanding the many proprietary digitalis preparations that are being offered with great enthusiasm to the medical profession, their dispensers making many claims for their superiority, claims that seem not justified as far as my own clinical experience goes."

The dosage which will secure the digitalization of a patient and thereby produce a therapeutic effect may be roughly computed on the basis of the patient's weight. Provided the patient has not received digitalis within the previous two weeks, the dosage should approximate $1\frac{1}{2}$ grains for every 10 pounds (4.5 Kg.) of body weight, plus $1\frac{1}{2}$ grains for each day during the period of digitalization. That is, if a patient who weighs

150 pounds (68 Kg.) is to be digitalized over a two day period he will receive approximately 25 grains (from 20 to 30 grains [$1\frac{1}{2}$ to 2 Gm.]). From 12 to 15 grains (0.8 to 1 Gm.) may be given in divided doses at six or eight hour intervals during the first twenty-four hours and the remainder in divided doses during the subsequent twenty-four hours. If the need for rapid digitalization is urgent and the patient has not received digitalis within the previous two weeks, he may be given as much as $7\frac{1}{2}$ grains (0.5 Gm.) at four hour intervals for two or three doses, followed by 3 grains (0.2 Gm.) at eight hour intervals until the requisite dose has been given. It should be borne in mind, however, that such massive doses of digitalis and rapid digitalization of a patient as have just been outlined are to be resorted to only in emergency cases and then only when the patient can be kept under close observation. In all other cases digitalization should proceed more slowly and cautiously.

The computation of the dosage by body weight is only an approximation. Relatively more digitalis should be given to children, to light weight adults and to patients with a marked degree of decompensation. Children in particular require fairly large doses of the drug to obtain a therapeutic effect. Patients of advanced years usually require less digitalis than their weight would indicate. When edema is present, its added weight should not be included in the body weight on which the digitalis dosage is computed; instead, the patient's average weight for the year prior to the onset of the edema may be taken as a basis.

As a patient is not fully digitalized until a state of saturation has been reached, the dosage in emergency cases should be sufficient to produce either a therapeutic effect or early evidence of approaching toxicity. The drug should not be withdrawn, however, solely because of a single spell of vomiting or headache. In cases of congestive heart failure, vomiting may be due to congestion of the gastric mucosa and therefore be a manifestation of the cardiac failure, rather than of the toxicity arising from the action of the drug. If vomiting prevents the oral administration of digitalis, equivalent amounts of the drug in solution may be given intravenously until it is tolerated by the oral route.

In order to maintain a patient in a state of therapeutic digitalization it is necessary that he receive daily an amount of the drug equivalent to that which he excretes. This is generally about $1\frac{1}{2}$ grains daily. If this dose is not effective in slowing the heart rate in a case of rapid ventricular action or in improving the circulation in a case of congestive heart failure, 3 grains may be given every other day and $1\frac{1}{2}$ grains on the alternate days. In rare cases it may be necessary to give 3 grains daily until the heart becomes compensated. It is important that the particular maintenance dose which will achieve the optimum therapeutic effect be determined for each individual patient by both clinical and electrocardiographic observations.

In the presence of a toxic state arising from the overdigitalization of the patient, there will usually be manifested clinically a slowing of the heart to a rate of 60 beats per minute or less, and the appearance of premature contractions producing a coupling of the beats, heard on auscultation. Certain gastrointestinal, ocular and neurologic symptoms may also appear such as nausea, vomiting, dimness of vision, inability to focus the eyes, restlessness and disorientation. The electro-

2. Christian, Henry A.: *Drug Treatment of Cardiac Decompensation*, J. A. M. A. 108: 44-46 (Jan. 2) 1937.

cardiogram will show an exaggeration of the T wave deflection associated with a "digitalis effect"; a prolongation of the PR interval, indicating an auricular-ventricular block; premature ventricular beats occurring in couplets (bigeminy), and, in grave toxic states, the appearance of ventricular paroxysmal tachycardia. It is because the electrocardiogram shows definite evidences of the approach of a state of digitalis intoxication of the myocardium that the administration of the drug should be controlled by frequent electrocardiographic readings. When clinical or electrocardiographic signs of overdigitalization appear, the drug should be withheld for a day or two and its administration resumed in decreased dosage.

Digitalis acts directly on the heart, (1) depressing the function of the sino-auricular and auriculoventricular nodes, (2) contracting the muscle fibers, (3) decreasing the size of the chamber walls, (4) lessening auricular and ventricular irritability, (5) prolonging diastole and (6) increasing the force of systole.³ The clinical results of digitalis therapy are usually manifested in a slowing of the heart rate and in a general improvement of the circulation. In cases of failing or dilated hearts the administration of digitalis frequently results in an increase of the cardiac output and the relief of venous congestion. Occasionally, however, fibrosis of the myocardium is so extensive that digitalis cannot restore compensation. When hyperthyroidism is the underlying cause of cardiac dilatation and failure or of a rapid ventricular rate, the results of digitalis therapy will be disappointing until the thyroid condition has received appropriate treatment.

CONGESTIVE HEART FAILURE

Acute congestive heart failure is one of the most commonly seen conditions demanding emergency treatment. Cases of organic heart disease such as valvular incompetency and stenosis may remain compensated under a normal regimen; but when the burden of infection, fatigue, excitement, prolonged nervous strain or a rapid ventricular rate is added, congestive heart failure may suddenly appear. If the precipitating factor is not removed, the attack of failure may develop rapidly into an emergency.

In left ventricular failure, dyspnea, orthopnea and air hunger appear and increase in severity with the degree of failure. The associated pulmonary congestion may give rise to a productive cough and to hemoptysis. Patients with failure of the left side of the heart are subject to alarming and not infrequently fatal attacks of acute paroxysmal dyspnea. The attacks, which are usually nocturnal, are marked by extreme dyspnea and a cough which is productive of profuse frothy blood-tinged sputum. The blood pressure is at first elevated but later falls. As the pulmonary edema becomes acute, circulatory collapse occurs accompanied by pallor and cyanosis, marked perspiration and a rapid feeble radial pulse. If treatment is delayed, death may ensue. The most important emergency measure is the subcutaneous administration of morphine sulfate, one-fourth grain (0.015 Gm.), repeated in fifteen minutes if relief has not been obtained. If the morphine is not effective in

abolishing the attack aminophyllin (theophylline with ethylenediamine), $\frac{1}{100}$ grain in 20 cc. of physiologic solution of sodium chloride, should be administered intravenously, slowly during a five minute period. Clinical studies have shown that the drug causes a decline in the intrathecal and venous pressures with a subsequent diminishing of the dyspnea.⁴ Oxygen when available should be administered promptly. Phlebotomy of from 300 to 500 cc. of venous blood is frequently followed by striking improvement. As to the use of digitalis in acute paroxysmal dyspnea, Wolferth⁵ has recently expressed an opinion which I have long held on the ineffectiveness of digitalis therapy in an acute emergency condition. He states: "I find that many physicians in treating attacks of paroxysmal cardiac dyspnea are apt to give hypodermic injections of digitalis. The dosage usually employed ranges from $1\frac{1}{2}$ to 3 grains. Although . . . digitalis is often useful as a preventive measure it must be given in therapeutically effective dosage. I object to its use during an attack for the following reasons: (1) The dosage is usually too small to be effective; (2) even though enough be given, its action is too slow to combat an emergency, and (3) the use of digitalis may divert attention from more effective measures that should be employed."

When right ventricular failure is predominant there are dyspnea, marked fatigue, gastric and abdominal flatulence, nausea, venous engorgement, enlargement and tenderness of the liver, ascites, edema of the extremities and at times anasarca and hydrothorax. When a rapid elimination of the edema is necessary salyrgan, 1 cc. of a 10 per cent solution, should be injected intravenously, with or without the oral administration of ammonium chloride, $22\frac{1}{2}$ grains (1.5 Gm.) four times daily, in enteric coated capsules of $7\frac{1}{2}$ grains. The initial dose of salyrgan may be repeated after the lapse of from two to three days, when, if needed, the dose may be doubled. If large accumulations of transudates are present in the thoracic or peritoneal cavities, it may be necessary to give the patient prompt relief by aspirating the fluid, in which case a thoracentesis or an abdominal paracentesis should be carried out. The Karel diet should be instituted at once. Oxygen should be administered as an emergency measure, and morphine sulfate should be given freely to relieve the patient of dyspnea and nervousness. The slow intravenous administration of from 50 to 100 cc. of a hypertonic solution of dextrose, of 50 per cent concentration, has value in some cases in that it aids the failing heart muscle in replenishing lost glycogen. Absolute bed rest should be maintained. Patients, even children, find an upright or semirecumbent position more comfortable than recumbency, as pressure from the engorged liver is less distressing. The use of a cardiac bed, when available, is of value.

In extreme cases of failure involving either the left or the right side or both sides of the heart when the circulation is gravely embarrassed, the patient must be given immediate relief. Strophanthin should be administered intravenously, $\frac{1}{100}$ grain, provided the patient has not been properly digitalized as evidenced by an electrocardiogram. If the patient has been taking small doses of digitalis during the preceding fourteen days,

3. Stewart, H. J.; Crane, N. F.; Deitrick, J. E., and Thompson, W. P.: Action of Digitalis in Compensated Heart Disease, *Arch. Int. Med.* 62: 547-568 (Oct.) 1938. Stewart, H. J.; Deitrick, J. E.; Crane, N. F., and Wheeler, C. H.: Action of Digitalis in Uncompensated Heart Disease, *ibid.* 62: 569-592 (Oct.) 1938. White, Paul Dudley: *Heart Disease*, ed. 2, New York, Macmillan Company, 1937, pp. 547-556.

4. Greene, J. A.; Paul, W. D., and Feller, A. E.: The Action of Theophylline Ethylenediamine on Venous and Intrathecal Pressures and on Bronchial Obstruction, *J. A. M. A.* 109: 1712-1715 (Nov. 20) 1937.

5. Wolferth, Charles C.: The Diagnosis and Treatment of Paroxysmal Cardiac Dyspnea, *M. Clin. North America* 22: 1735-1746 (Nov.) 1938.

the dose of strophanthin must be regulated accordingly. Strophanthin exerts an action on the heart similar to that produced by digitalis; but, unlike digitalis leaves, it acts almost at once. Its full effect is produced in about one hour and is prolonged for from twelve to twenty-four hours. The initial dose of strophanthin may be followed by two subsequent doses at intervals of from eight to twelve hours. When possible an electrocardiogram should be taken to determine the degree of digitalis effect. After the acute stage has subsided the patient may be put on the oral administration of powdered digitalis leaves.

The edema of nephritic origin is sometimes confused with the edema arising from cardiac conditions. Within the month three patients with marked edema have come under my observation. All three patients had had prolonged digitalis therapy with no abatement of their symptoms. A carefully taken history and laboratory tests showed glomerulonephritis to be the underlying disease in each case. One patient had been taking bromides for months and had marked bromide dermatitis complicated by multiple ulcerations of the lower extremities.

A discussion of congestive heart failure should not be closed, I believe, without making clear the distinction between cardiac failure and a failure of the peripheral circulation. Peripheral failure produces the symptoms and signs of collapse and shock, including pallor, perspiration, cold clammy skin, weak heart sounds, rapid thready pulse and low blood pressure. These phenomena are seen occasionally in surgical cases, in severe hemorrhage, in dehydration, in coronary thrombosis, in arterial embolism and in other conditions which for any reason produce a sudden decrease in the volume of the circulating blood or a sudden collapse of the vascular bed. In certain of these cases the heart itself may be entirely normal in its capacity to function properly, but the vascular system fails to return a normal volume of blood to the heart.

CIRCULATORY FAILURE

The circulatory type of failure may require either of two kinds of treatment, depending on the factor which has produced the collapse. If a sudden decrease in the blood volume from hemorrhage or dehydration has been the precipitating factor, a transfusion of whole blood or the intravenous administration of small doses of 20 per cent dextrose solution or of salt solution is beneficial. If, however, depression of the central nervous system has been a contributing factor in the production of the shock through loss of vascular tone, drugs which act on the central nervous system should be administered, such as hot coffee, brandy, strychnine sulfate, one-sixtieth to one-fortieth grain (0.001 to 0.0015 Gm.) subcutaneously, or caffeine with sodium benzoate, 7½ to 15 grains subcutaneously, or intravenously if a more prompt response is desired. These drugs, as well as nikethamide (coramine), metrazol, theobromine, camphor and aminophyllin, have at times been regarded as cardiac stimulants, but it is now generally accepted that their value lies in the effect which they produce on the peripheral vascular system or on the respiratory center, secondarily to a primary effect on the central nervous system. White⁶ has pointed out that although caffeine has an important stimulating effect on the nervous system and vasomotor center and

nikethamide and aminophyllin often stimulate and regulate a depressed respiratory center, they are not known to have a direct effect on the action of the myocardium. None of these drugs, therefore, should be substituted for digitalis in the treatment of congestive heart failure. Digitalis, however, is not known to exert a direct effect on the vascular system and therefore should not be administered in circulatory failure. It should be clearly understood by surgeons as well as by clinicians that digitalis therapy not only has no value in collapse or surgical shock but may even do harm in that it slows the heart rate. Much of the confusion concerning the results of digitalis therapy in coronary thrombosis has, I believe, come from an attempt to institute digitalization while vascular collapse was a predominant factor in the clinical picture. In the presence of shock associated with low venous pressure the use of digitalis is contraindicated.

CORONARY THROMBOSIS

The syndrome of acute coronary thrombosis is too well known to be discussed in detail. If pain is present, its continued intensity and prolonged duration and the ineffectiveness of the nitrites to control it, will differentiate it from the pain of angina pectoris. Pain may be absent in coronary thrombosis, and intense dyspnea may be the striking symptom. Peripheral vascular failure with signs and symptoms of collapse and shock may be present without pain or dyspnea. On even a tentative diagnosis of coronary occlusion, the patient should be put at complete rest in bed. If within twenty-four or thirty-six hours signs of infarction appear, such as a rise in temperature, an elevation of the leukocyte count and a pericardial friction rub, the patient should remain at rest for several weeks. The important drug in the emergency treatment of acute coronary thrombosis is morphine sulfate, which should be given promptly and in sufficient amounts to quiet the patient and to relieve him of pain. From one fourth to one half grain may be given subcutaneously and the dose repeated if necessary. If there is cyanosis, rapid heart action, dyspnea, orthopnea or other signs of myocardial anoxemia, oxygen in concentrations of from 50 to 80 per cent should be administered by means of a tent. When dyspnea is persistent or when vomiting is producing dehydration, the intravenous administration of a hypertonic solution of dextrose, from 50 to 100 cc. of a 50 per cent solution, should be carried out slowly and cautiously and repeated once or twice daily as needed. Caffeine with sodium benzoate, 7½ grains, may be given intravenously if there is circulatory collapse or shock. The intracardiac or subcutaneous injection of epinephrine should be resorted to in the rare instances in which the Adams-Stokes syndrome complicates coronary occlusion. Quinidine sulfate should be given orally when there is a rapid ventricular rate, but the drug should be administered guardedly. The use of mechoyl is contraindicated in the presence of coronary disease. Digitalis therapy has no place in the treatment of coronary thrombosis, except when auricular flutter or chronic auricular fibrillation is present with a rapid ventricular rate or when congestive heart failure has supervened. It should be borne in mind that massive doses of digitalis are not well tolerated during the healing stage of myocardial infarction. It should also be borne in mind that in an occasional heart there are extensive areas of coronary sclerosis, myocardial degeneration and massive infarction which leave no cardiac muscle for drugs to act on.

6. White, Paul Dudley: *Heart Disease*, ed. 2, New York, Macmillan Company, 1937, pp. 557-558.

PERICARDITIS

A cardiac emergency occasionally arises in cases of acute pericarditis when a rapid accumulation of fluid in the pericardial sac causes marked cardiac compression. The forms of acute pericarditis in which effusions may accumulate in sufficient amounts to impede the action of the heart are (1) purulent pericarditis, secondary to a pyogenic infection such as empyema, pneumonia, an intrathoracic abscess or septicemia; (2) fibrinous pericarditis, associated with the rheumatic and other nonpurulent infections, and (3) tuberculous pericarditis, seen only when tuberculosis is present elsewhere in the body. As the cardiac compression develops, the force of the ventricular contractions is diminished and signs of circulatory embarrassment appear. The venous pressure increases and the veins of the neck appear dilated and engorged. The arterial pressure falls and the pulse volume is diminished. The heart sounds become distant and faint. The area of cardiac dullness is increased, usually to the right and to the left. A roentgenogram of the heart will show a globular contour with a bulging of both lower angles. Extensive pericardial effusion of rheumatic origin frequently gives rise to dyspnea, orthopnea, cyanosis and precordial pain. Ewart's sign, due to compression of the left lung, may appear at the angle of the left scapula as dullness, bronchial breathing and bronchophony. A to and fro friction rub may sometimes be heard over the base of the heart. A rapidly accumulating pericardial effusion is generally accompanied by an exacerbation of the symptoms of the primary infection.

Treatment should be directed both to the relief of the cardiac compression and to the control of the underlying condition, whatever the infection may be which is responsible for the acute pericarditis. If pain is present and severe, morphine sulfate from one-eighth to one-fourth grain (0.008 to 0.016 Gm.) should be administered subcutaneously. If the pain is not severe, codeine, the salicylates or the bromides may be given. When pericardial effusion is accompanied by marked circulatory embarrassment, pericardiocentesis promptly carried out may be a life-saving measure. The aspiration of even a relatively small amount of the fluid will often relieve the patient of his distress.

A favorable site for the puncture is in the fifth interspace at a point 1 or 2 cm. within the left border of cardiac dullness, as determined by percussion or by a roentgenogram. Local anesthesia of the site is desirable. An aspirating needle of medium caliber is inserted backward and inward, slowly penetrating to a depth of from 3 to 5 cm., with suction applied frequently to obtain fluid. If no fluid can be aspirated, the needle should be tilted at various angles, partially withdrawn, or completely withdrawn and inserted elsewhere. In children or young adults a safe and convenient site for the puncture is the left posterior part of the chest wall in the seventh or eighth interspace at a point in the midscapular line. The patient's left arm should be raised. The needle will have to be inserted to a depth of from 5 to 8 cm. It is usually not necessary to repeat the pericardiocentesis. Occasionally, however, with rheumatic patients the fluid must be aspirated every few days for a limited period and with tuberculous patients every week or two for a much longer time.

During pericardiocentesis of a patient with purulent effusion it is sometimes necessary, if the pus is thick,

to substitute a trocar or a needle of larger caliber for the aspirating needle with which the procedure was begun. When pus is discovered during the course of a pericardiocentesis, it is imperative that the surgical procedure of pericardiotomy be instituted at once and that the pericardium be drained at its base. As recovery depends on instituting drainage early in the course of purulent pericarditis, an exploratory pericardiocentesis should be carried out when pericardial effusion is suspected in cases of pyogenic infections. However, before these measures are resorted to in cases in which cardiac compression has not yet developed and the infectious process is largely restricted to the pericardium, sodium cacodylate from 5 to 8 grains (0.3 to 0.5 Gm.) in sterile solution should be injected intravenously. This dose with an additional 2 or 3 grains (0.1 or 0.2 Gm.) a day should be repeated daily for three or four successive days. If a definite cessation or subsidence of the effusion does not occur, a pericardiocentesis should then be resorted to.

In cases of pericardial effusion arising from a non-pyogenic infection, when the circulation is not gravely embarrassed, a delay of thirty-six or forty-eight hours will in many instances show a spontaneous subsidence of the effusion coincidental with an abatement of the underlying infection. This spontaneous improvement is frequently seen in cases of rheumatic pericarditis. Pericardiocentesis in these cases should therefore be restricted to those patients whose cardiac compression has resulted in marked circulatory embarrassment.

EMBOLISM

The emergencies arising from arterial embolism within the systemic circulation are inextricably related to cardiac conditions, as the formation of the emboli occurs in the chambers of the heart. Two predisposing factors in related sequence usually contribute to the presence of systemic arterial emboli. The first is a slowing of the blood stream within the heart chambers, due to mitral stenosis, long standing auricular fibrillation, or dilatation and functional failure of the myocardium. The resulting stasis favors the formation of mural thrombi. The second contributing factor is the subsequent restoration of normal rhythm or myocardial function, which results in more forcible contractions of the chamber walls, a breaking up of the mural thrombi and the expulsion of the detached portions into the systemic circulation. The ultimate destination of the emboli, according to clinical experience, will be lodgment within the spleen, kidneys or other parenchymal viscera, within the brain, the intestinal walls or the myocardium through the coronary circulation, or in the arteries of the extremities.

Pulmonary emboli may arise in either of two ways. They may be detached from mural thrombi within the right auricle or ventricle, whence they will inevitably be propelled into the pulmonary circuit unless there exists a congenital patency of the auricular or ventricular septum, in which case they may enter the left side of the heart and subsequently the systemic circulation. However, in the majority of cases pulmonary emboli originate in thrombosed veins, usually the larger veins of the thigh or pelvis, which often are apparently free from evidences of concomitant phlebitis. It is thought that three factors play a part in the formation of a thrombus within a vein: (1) damage to the vas-

cular wall, (2) an increase in the coagulability of the blood and (3) a decrease in the velocity of the venous blood flow. Pulmonary embolism is not infrequent in cases of heart failure and of chronic invalidism among the older age groups when venous pressure and prolonged circulation time are present. It also occurs as a postoperative or puerperal accident.

Embotic deposits within the parenchymal organs cause areas of infarction. The spleen, kidneys and lungs tolerate one or more infarctions if they are not massive, and a restitution of approximately normal function not uncommonly occurs. The brain, if vital regions are not involved, will also tolerate small areas of infarction. In the emergency treatment of embolic deposits in the parenchymal organs, absolute rest in bed and the complete relief of pain are of prime importance. Morphine sulfate from one-fourth to one-half grain should be given subcutaneously and repeated if necessary. In pulmonary infarction the patient should be placed in an oxygen tent. Supplying him with an adequate amount of oxygen not only will lessen the strain on the circulation but will add materially to his comfort and will ease difficult respiration. Shock and collapse, which invariably accompany all forms of massive arterial occlusion and multiple embolic deposits, should receive appropriate therapy, as previously outlined in the discussion of the treatment of peripheral vascular failure.

Embotic occlusion of the arteries of the extremities and of the intestine results in the development of gangrene. It is in these cases that early diagnosis and prompt surgical intervention are of the utmost importance in saving the patient's life. When embolic occlusion involves the extremities there is frequently an associated spasm of contiguous arteries. If untreated, the spasm may extend the area of gangrene. The intravenous injection of papaverine hydrochloride one-half grain will frequently abolish the associated spasm. The extremity which is affected should be kept warm but should not have direct heat applied to it. When only a small artery is involved, the development of a collateral circulation may prevent the development of gangrene. Unfortunately, subsequent emboli frequently appear in the circulation to further endanger the life of the patient.

SUMMARY

In the treatment of the cardiac emergencies, the time element is often of inestimable importance. The proper drug if administered promptly will frequently give immediate relief and may in some cases be a means of saving the patient's life. It is advisable for every physician when confronted by a cardiac emergency to have certain drugs available for instant use.

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The Spirit of Aesculapius.—The progress of medicine has ever been from the temple to the medical school. Though the statue of Aesculapius was carried from Epidaurus to Tiber Island, it was something more important that Rahere brought from Tiber Island to England; it was the spirit of Aesculapius opening the path to the medical school. Man is always too ready to mistake the symbol for the reality; the stone on which the laws are graven is apt to become more sacred than the laws themselves; but the statue of Aesculapius is unavailing if the spirit dies.—Langdon-Brown, Sir Walter: *Thus We Are Men*, New York, Longmans, Green & Co., 1939.

PUERPERAL INFECTION WITH VEGETATIVE ENDOCARDITIS

REPORT OF SULFANILAMIDE THERAPY IN TWO FATAL CASES DUE TO STREPTOCOCCUS HAEMOLYTICUS GROUPS B AND C

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During a recent study of sulfanilamide therapy in puerperal infection¹ two cases of endocarditis due to *Streptococcus haemolyticus* groups B and C, respectively, were encountered. Since fatal infection due to group B is infrequent and has not been previously reported in the case of group C, report of these cases should be of interest.

REPORT OF CASES

CASE 1.—B. R., an Italian housewife aged 28, was admitted August 29, 1938, to the service of Dr. Charles A. Gordon at the Kings County Hospital. Her last menses occurred June 26. Two months later she suffered from backache and passed clots of blood by vagina. Within an hour she had a chill, followed by fever. Vaginal examination showed a sanguinopurulent discharge, a soft cervix which admitted the finger tip and a soft, tender uterus the size of a three months pregnancy. The leukocyte count was 20,000 with 87 per cent polymorphonuclears; the hemoglobin content was 80 per cent and red cell count 4,100,000. A diagnosis of septic abortion was made.

Removal of possible retained secundines was not undertaken because of the severe uterine infection. On September 4, although the fever had abated somewhat, sulfanilamide therapy was instituted. During the next four days a total of 320 grains (21 Gm.) was given. Chemotherapy was discontinued when it was found that the hemoglobin had fallen to 45 per cent and the red cell count to 2,200,000. The temperature during the following week was septic in type, rising to 105.4 F. and falling to 99.6 F. intermittently, as shown in the chart. The patient was surprisingly free from subjective symptoms. Vaginal bleeding of moderate amount occurred almost daily. Transfusions of blood were given every second or third day. In spite of the large quantity of blood (4,275 cc.) which the patient received, the hemoglobin never rose above 58 per cent.

Four blood cultures taken during the three weeks after admission were positive for *Streptococcus haemolyticus* group C. The source of the bacteremia was thought to be pelvic thrombophlebitis. After the report of the first positive blood culture on September 11, sulfanilamide was again administered. Massive doses were now given, and within ten days the patient received 890 grains (58 Gm.). In spite of the intensive chemotherapy, the patient grew progressively worse.

On the twenty-first day after admission a rough systolic murmur was heard at the apex, and the spleen was enlarged. Bacterial endocarditis was now suspected. September 29 the patient complained of sudden pain in the lower part of the back and in both legs and died shortly afterward.

Necropsy was performed by Dr. Casper C. Burn. About 500 cc. of straw-colored fluid was found in the right pleural cavity and 300 cc. in the left pleural cavity, and about 50 cc. in the peritoneal cavity.

The heart weighed 270 Gm. The epicardial surfaces were smooth and glistening. The mitral valve was the seat of a large friable vegetation. One of the leaflets had been destroyed by an ulcerative process; here the chordae tendineae were ruptured and detached. The greater part of the free border of the valve was involved in the necrotizing process. The remaining portion of the valve showed no evidence of old or chronic endocarditis.

From the Department of Obstetrics and Gynecology, Long Island College of Medicine Division, Kings County Hospital, and the Department of Pathology, Hoagland Laboratory, Long Island College of Medicine, I. Gordon, C. A., and Rosenthal, A. H.: *Sulfanilamide Therapy in Severe Puerperal Infection*, Surg., Gynec. & Obst. 69: 631 (Nov.) 1937.

as it was thin and velamentous. The other valves appeared normal. On microscopic examination small abscesses were found throughout the myocardium.

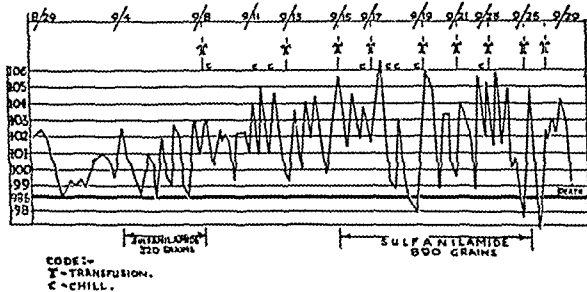
The spleen weighed 300 Gm. and contained a large anemic infarct. A small infarct was present in one kidney. A large white saddle embolus was lodged at the bifurcation of the aorta, completely occluding the lumen. The iliac arteries were collapsed and bloodless.

The uterus was slightly enlarged; the fundus was globoid and contained a large polyp-like mass of placental tissue, covered with a yellowish necrotic exudate which extended into the myometrium. The remaining endometrium was dull, gray and covered with exudate.

The streptococcus recovered in the blood culture was identified serologically as group C.^{1a} Following the procedure of Lancefield,² the hydrochloric acid extract (tenth-molar) of a broth culture was neutralized to litmus and then centrifuged; the clear supernatant fluid was tested against antisera to streptococcus groups A to H inclusive. A clearcut precipitin reaction was obtained with group C antiserum.

Although no evidence of pelvic thrombophlebitis was found on gross or microscopic examination, it is probable that the retained infected placental tissue was the source for the invasion of the blood stream by the streptococcus, with subsequent development of endocarditis and persistent bacteremia.

CASE 2.—C. H., a Negro woman aged 24, was first observed in the obstetric clinic. A history of rheumatic fever with cardiac involvement during childhood was obtained. She had had four previous deliveries. The first two pregnancies and labors were uncomplicated save that she went into premature



Temperature curve in case 1 showing the septic clinical course of the patient and the sulfanilamide therapy.

labor at seven months and delivered infants weighing 5 pounds (2.3 Kg.) each. During her third pregnancy she suffered what appeared to be a beginning attack of cardiac decompensation with arrhythmia, but subsequently she was delivered without cardiac symptoms. The fourth pregnancy and labor were uncomplicated. The last menstrual period was on May 15, 1938. The patient had complained of dyspnea and orthopnea since the second month of pregnancy.

Examination revealed an enlarged heart with presystolic and systolic apical murmurs. X-ray examination of the chest showed a globular heart. A diagnosis of rheumatic heart disease with mitral stenosis and insufficiency was made. During the remainder of her pregnancy the patient suffered headaches, spots before her eyes, edema and a rise in blood pressure to 140 systolic, 84 diastolic.

The patient was admitted to the service of Dr. Charles A. Gordon Jan. 11, 1939, and was delivered spontaneously the next day of a 7½ pound (3.4 Kg.) fetus with use of local anesthesia. There was no change in her cardiac status during labor. Her immediate postpartum course was uneventful. On the fifth day post partum there was a rise in temperature to 104 F. with a rise in pulse rate. The blood count was normal and the patient felt well. However, both blood and uterine cultures were positive for *Streptococcus haemolyticus* group B. She was given a blood transfusion of 250 cc. and received 20 grains (1.3 Gm.) of sulfanilamide every four hours.

The patient continued to have a septic type of fever but otherwise appeared well. Sulfanilamide therapy was discontinued on

the twelfth day post partum because of headache. At this time her condition was improved and the blood culture was negative. The sulfanilamide titer reached its highest level of 12 mg. after 820 grains (53 Gm.) had been given over a period of seven days. On the sixteenth day post partum she had a chill and a rise in temperature to 104 F. A blood transfusion of 250 cc. was given and sulfanilamide therapy was resumed. A septic type of fever with but few other symptoms continued thereafter.

Four blood cultures taken over a period of six days were negative. February 4, however, hemolytic streptococci were found and subsequent cultures were consistently positive for this organism. Sulfanilamide therapy was again stopped on the twenty-sixth day post partum. By this time a total of 2,250 grains (146 Gm.) had been given.

On the thirty-second day post partum a change in the cardiac status of the patient was noted. The apex was beating violently; the murmurs had changed in quality and were now heard over the entire chest. A diagnosis of acute bacterial endocarditis was made. Petechiae were not seen in the conjunctivas until nine days later. Blood and uterine cultures continued to be positive for the hemolytic streptococcus.

On the forty-third day post partum the patient was started on sulfapyridine therapy and received a total of 247 grains (16 Gm.) in three days. On the day after this medication was instituted clinical signs of a cerebral embolism appeared, and two days later she died.

Necropsy was performed by Dr. Casper C. Burn. Several small petechiae with white centers were noted in the conjunctivas. One hundred and fifty cc. of clear straw-colored fluid was found in the left pleural cavity and 75 cc. in the right. Many petechial and purpuric hemorrhages were scattered over the pleural surfaces of the lungs, which presented on section small areas of consolidation.

The heart weighed 370 Gm. The valves on the right side of the heart were thin and delicate. The mitral valve adjacent to the anterior papillary muscle was ulcerated. To it was attached a large friable, fungating vegetation. Directly in apposition there was a smaller vegetation. The ulceration beneath the larger vegetation extended for a short distance into the wall of the left auricle. The aortic cusps were regular and not fused. On the corpus arantii of the anterior valve leaflet there was a small, fresh friable vegetation. The myocardium appeared mottled with pale red and light brown areas. Minute circumscribed opaque areas were found in the wall of the left ventricle a few millimeters beneath the epicardium. A small infarct was observed in one kidney and several infarcts were present in the spleen.

The ovaries and tubes appeared normal. The uterus was small and firm; when it was opened a necrotizing endometritis was found. Microscopic examination revealed an organizing thrombosis of the parovarian veins.

The hemolytic streptococcus isolated repeatedly from blood and uterine cultures was identified as group B by the method of Lancefield. The micro-organism differed from group C in that the growth on rabbit blood agar was firmer in consistency and more opaque. Marked hemolysis was noted both aerobically and anaerobically on blood agar plates. A slide agglutination test with the patient's serum gave a 4 plus reaction.

On the basis of the clinical course of the patient the port of entry of the streptococcus was probably the uterus, although the necropsy showed little evidence for this pathogenesis of the bacterial endocarditis.

Bliss and her collaborators³ have shown that sulfanilamide in broth in a dilution of 1:10,000 has a definite bacteriostatic effect on strains belonging to groups A, B and C but not D or E. The best results were obtained with A, although good results were obtained with B and C. They also noted that sulfanilamide is of value in the treatment of infections in animals caused by streptococcus of group C. Seastone⁴

1a. By Dr. Calvin B. Coulter, Director of Laboratory of Bacteriology, Kings County Hospital.

2. Lancefield, R. C.: Serological Differentiation of Human and Other Groups of Hemolytic Streptococci, *J. Exper. Med.* 57: 571 (April) 1933.

3. Bliss, Eleanor A.; Long, P. H., and Feinstone, W. H.: Differentiation of Streptococci and Its Relation to Sulfanilamide Therapy, *South. M. J.* 31: 303 (March) 1938.

4. Seastone, C. V.: Effect of Sulfanilamide on Group C Hemolytic Streptococcus Infections, *J. Immunol.* 33: 403 (Nov.) 1937.

noted the favorable effect of sulfanilamide therapy on guinea pigs infected with two strains of group C. Colebrook and Purdie,⁵ however, observed that with one group C strain they could obtain only a slight protective effect in mice.

Since in both of the cases here reported sulfanilamide therapy was disappointing, experiments were undertaken to determine the effect of the drug on these particular strains of streptococci. Streptococcus cultures were grown in infusion broth for eight hours at 34 C. Serial dilutions in broth of 10^{-5} , 10^{-6} and 10^{-7} were made from these cultures and sulfanilamide was added until final concentrations of 1:10,000 were obtained. Similar tubes without sulfanilamide were prepared as controls. The two series of cultures were examined for presence and amount of growth after incubation at 37, 34 and 22 C. for fifteen hours. No difference could be detected in the rate of growth in the sulfanilamide tubes as compared with the controls, so that it was believed that little if any bacteriostasis occurred. Recently, however, White and Parker⁶ have found that bactericidal action due to sulfanilamide cannot be demonstrated at a test temperature lower than 39 C. Evidence has been reported by Levaditi and Vaisman⁷ that sulfanilamide exerts its effect on the streptococcus through its influence on the capsule of the micro-organisms. Experiments carried out in the Hoagland Laboratory of the Long Island College of Medicine⁸ show that temperatures between 39 and 41 C. exert a profound influence on the development of the streptococcus capsule, and it is possible that a bacteriostatic effect might have been demonstrated if incubation had been carried out at higher temperatures than 37 C.

To test experimentally the chemotherapeutic effect of sulfanilamide on these strains of streptococci of groups B and C, white mice weighing from 18 to 20 Gm. were inoculated with cultures of the micro-organisms. Infusion broth cultures grown for fifteen hours at 37 C. were diluted from 10^{-1} to 10^{-7} . For each of the serial dilutions six mice were inoculated, each being given intraperitoneally 0.5 cc. of the culture dilution. Immediately after the peritoneal injections three mice in each series were given subcutaneously 8 mg. of sulfanilamide. This dose was given daily for three days and 1 mg. daily for the six following days. The remaining mice served as controls. The control mice of group B which received dilutions of 10^{-1} to 10^{-5} died within one to eight days, those receiving the dilutions of 10^{-6} died within fifteen to eighteen days, and those given the dilution 10^{-7} survived for thirty days. The mice which were given sulfanilamide and which received culture dilutions of from 10^{-1} to 10^{-5} died within one to nine days, while those receiving dilutions of 10^{-6} and 10^{-7} survived for thirty days. Since the mice to which sulfanilamide had been administered died almost as early as the control mice, with the exception of the series of the 10^{-6} dilution, in which the treated mice survived and the controls died after fifteen days, one would be led to believe that sulfanilamide exerted only a mild chemotherapeutic effect on experimental infections in mice with this strain of group B streptococcus.

In the case of the group C streptococcus the control mice receiving dilutions of from 10^{-1} to 10^{-5} survived from one to six days, while the treated mice died between one and seven days after inoculation. Mice given dilutions of 10^{-6} and 10^{-7} of broth in the control and treated series survived for more than thirty days. There was thus no significant difference between the mice receiving sulfanilamide and the untreated controls.

We observed, however, as did Long and Bliss,⁹ that more phagocytosis occurred in the peritoneal exudate of the treated mice than in the controls. The infecting organism was recovered in a number of instances from the peritoneum and heart's blood of the control mice and from those which had received sulfanilamide.

COMMENT

The majority of human streptococcic infections are thought to be due to members of group A. Following Lancefield,² streptococci of group C have been regarded as pathogenic for animals rather than man. Among a number of strains of hemolytic streptococci from parturient women, Lancefield and Hare¹⁰ found several of group C, but only one was from a patient with a febrile puerperium. Bliss and her associates³ likewise have emphasized the lack of pathogenicity of group C for man. Evidence has been presented by others, however, that group C may be pathogenic for human beings. Hare,¹¹ Plummer¹² and Evans and Verder¹³ have noted that it may cause erysipelas. Plummer found among forty-seven cases of puerperal infection due to streptococci forty-four of group A and two of group C.

Congdon¹⁴ classified the streptococci from twelve cases of septic abortion. Eight were of group A, two of group B, one of group C and one of group D. The two fatal cases, however, belonged to group A. Evans and Verder found fourteen strains of group C streptococci among thirty-six strains isolated from cases of puerperal infection. All occurred, however, during 1931 and 1932 when a wave of group C puerperal infection occurred in London similar to the wave of erysipelas infection due to group C which was observed in Baltimore in 1935. Colebrook and Purdie have reported two cases of puerperal infection due to group C in a series of 100 cases. In both, however, the infection was limited to the uterus, vagina and perineum. Fatal puerperal infection caused by group C is reported here for the first time to our knowledge.

Fatalities due to group B infections have been noted by several authors. Two cases reported by Fry¹⁵ showed vegetative endocarditis similar to that described here and caused by group B, but neither presented post-mortem evidence of uterine infection. In our group B case it was not conclusively demonstrated that the infection had entered through the uterus, but this seems probable. However, the picture presented by these three

9. Long, P. H., and Bliss, Eleanor A.: Para-Amino-Benzene-Sulfanilamide and Its Derivatives: Experimental and Clinical Observations on Their Use in the Treatment of Beta-Hemolytic Streptococcal Infection. *J. A. M. A.* 108: 32 (Jan. 2) 1937.

10. Lancefield, R. C., and Hare, Ronald: Serological Differentiation of Pathogenic Strains of Hemolytic Streptococci from Parturient Women. *Exper. Med.* 61: 335 (March) 1935.

11. Hare, Ronald: Classification of Hemolytic Streptococci from the Nose and Throat of Normal Human Beings by Means of Precipitation Biochemical Tests. *J. Path. & Bact.* 41: 499 (Nov.) 1935.

12. Plummer, Helen: Serological Study of Hemolytic Streptococci. *Bact.* 30: 5 (July) 1935.

13. Evans, A. C., and Verder, Elizabeth: Studies on Hemolytic Streptococci: Characteristics of Human and Animal Strains of Groups A and C. *J. Bact.* 26: 133 (Aug.) 1938.

14. Congdon, P. M.: Streptococcal Infection in Childbirth and Septic Abortion: Source of Infection and Grouping of Hemolytic Strains. *Lancet* 2: 1227 (Dec. 7) 1935.

15. Fry, R. M.: Fatal Infections by Hemolytic Streptococcus Group B. *Lancet* 1: 199 (Jan. 22) 1938.

5. Colebrook, Leonard, and Purdie, A. W.: Treatment of 106 Cases of Puerperal Infection by Sulfanilamide. *Lancet* 2: 1237 (Nov. 27) 1937.

6. White, H. J., and Parker, J. M.: Bactericidal Effect of Sulfanilamide upon Beta Hemolytic Streptococci in Vitro. *J. Bact.* 36: 481 (Nov.) 1938.

7. Levaditi, C., and Vaisman, A.: Mécanisme de l'action curative et préventive du chlorhydrate de 4-sulfamido-2,4-diamino-azo-benzène et d'autres dérivés similaires dans l'infection streptococcique expérimentale. *Compt. rend. Soc. de biol.* 120: 1077, 1935.

8. Coulter, C. B., and Stone, Florence M., to be published.

cases of vegetative endocarditis, with little local reaction to indicate the port of entry, may prove to be characteristic of infections by the streptococcus of group B.

SUMMARY AND CONCLUSIONS

1. Two cases of vegetative endocarditis due to the hemolytic streptococcus groups B and C were observed. One was postabortal and the other probably post partum.

2. Death due to infection in the human being by the hemolytic streptococcus group C is reported for the first time to our knowledge.

3. Massive sulfanilamide therapy failed in both cases. The retention of infected placental tissue may have been a contributory factor in one case.

4. In vitro and in vivo experiments to determine the effect of sulfanilamide on the particular strains of streptococci found in these two cases were carried out. The results indicated little or no chemotherapeutic effect.

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NEUROTIC SYMPTOMS AND CHANGES OF BLOOD PRESSURE AND PULSE

FOLLOWING THE INJECTION OF EPINEPHRINE

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AND

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Our purpose in this study was (1) to observe the effect of epinephrine on the blood pressure and pulse rate of psychoneurotic and normal persons and (2) to compare the sensations following the injection, as given in subjective reports, with the symptoms recorded in the patients' clinical records.

Goetsch,¹ in his study of the effect of epinephrine on patients with hyperthyroidism, found that these patients reacted actively to 0.5 mg. of epinephrine given subcutaneously, whereas normal persons showed no reaction to this dose. He further indicated that many conditions such as "queer nervous disturbances, psychasthenia, psychoneuroses, hysteria, neurasthenia, melancholia and arteriosclerosis" gave essentially negative results, although in a few of these cases some acceleration of pulse and a slight rise of blood pressure occurred, but no subjective symptoms; or a slight transient reaction was observed.

Goetsch described a positive reaction to epinephrine as an early rise of blood pressure and pulse rate of over 10 points at least. He observed that many times there was a considerable increase in pulse rate, without much increase in blood pressure but with an increase of "signs and symptoms."

Tompkins and her associates,² in reporting a study in which Goetsch's procedure was utilized, further elaborated the typical epinephrine response, stating that diastolic pressure may rise, fall or remain unaltered. Parallel with these changes they noted an increase in

given characteristic signs and symptoms such as tremor, vasomotor reactions, palpitation and precordial pain. None of the normal persons they tested showed any of these reactions.

Our study was carried out on twenty-five psychoneurotic patients, fourteen men and eleven women, and on nineteen nurses and students, fourteen men and five women. The patients were all registered in the dispensary and came by appointment for the special observations.

Each subject was told to lie down on the examining table and relax and was informed that he was to be given an injection but was not told of what it consisted. The blood pressure and pulse rate were then recorded at frequent intervals, about one minute apart, until it was determined that a stable systolic blood pressure level had been reached.

The time interval before a fairly stable level was attained varied from subject to subject, the range being from three to twenty-seven minutes (average ten minutes) for patients and from three to eighteen minutes (average six minutes) for the normal subjects.

It was noted that numerous conditions caused rather wide fluctuations in blood pressure and pulse rate in some instances during the preliminary observation period. One patient's systolic pressure, for example, rose 26 points and the diastolic pressure 20 points when one of the investigators entered the room; another increase of 28 points in systolic pressure and 10 points in diastolic pressure occurred during an interval of five minutes when the patient cried and spoke of being ashamed to complain when she was not really sick. Again, when a syringe was brought into the room another patient's systolic pressure suddenly rose 16 points and the diastolic pressure dropped 10 points.

These unusual variations were seen about as frequently in the normal group as among the psychoneurotic patients. In one instance the systolic pressure rose 20 points and the diastolic pressure 12 points at a moment when the subject was laughing. In another instance the pulse rate rose 20 points, and in two subjects the diastolic pressure dropped 20 points without apparent cause. For the most part, however, fluctuations of blood pressure and pulse rate were small during the preliminary observation period, the patients averaging 3.4 points for systolic pressure, 4.1 for diastolic pressure and 0.5 for pulse rate. The corresponding values for the normal subjects were -0.9 , $+0.8$ and $+0.6$.

When it was established that the blood pressure and pulse readings were fairly constant, 0.5 cc. of physiologic solution of sodium chloride was injected into the cubital vein for the purpose of control observations. Readings of blood pressure and pulse rate were taken as soon as the injection was completed and every half minute thereafter until it was apparent that these were stable. This time interval was in all cases less than ten minutes. The identical procedure was then repeated, except that the material injected was 0.01 mg. of epinephrine (0.5 cc. of a 1:50,000 solution in 0.9 per cent sodium chloride). Readings were again taken every half minute until a return to the initial level occurred, the maximum time interval being eight and one-half minutes for the normal subjects and ten minutes for patients.

After the observations following each injection had been completed, the subjects were asked to give a report of the feelings and sensations they experienced after the injection.

From the Psychiatric Institute (Dr. H. Douglas Singer, Director) of the Research and Educational Hospitals of the University of Illinois College of Medicine.

1. Goetsch, Emil: *Newer Methods in the Diagnosis of Thyroid Disorders*; Pathological and Clinical, New York State J. Med. 18: 259-267 (July) 1918.

2. Tompkins, Edna H.; Sturgis, C. C., and Wearn, J. T.: *Studies on Epinephrine: II. The Effects of Epinephrine on the Basal Metabolism in Soldiers with "Irritable Heart," in Hyperthyroidism and in Normal Men*, Arch. Int. Med. 24: 269 (Sept.) 1919.

Table 1 shows the blood pressure and pulse changes which followed the injection of epinephrine. The maximum change in systolic pressure of patients was considerably larger than of the normal subjects, 68 versus 40 mm. of mercury, and the range was almost twice as great. The average change was 24.3 mm. for patients and 18.5 mm. for the normal group, a difference of 5.8 mm. The coefficient of reliability of this

TABLE 1.—Changes in Blood Pressure and Pulse Following the Intravenous Injection of 0.01 Mg. of Epinephrine

		No. of Cases*	Change			Standard Deviation	Probable Error		C. R.†
			Mini-mum	Maxi-mum	Mean		Mean	Difference	
Systolic blood pressure	Patients	25	0	68	24.3	15.9	2.144	2.626	2.3
	Controls	19	4	40	18.5	9.8	1.518		
Diastolic blood pressure	Patients	25	±6	30	2.8	15.3	2.064	3.239	2.4
	Controls	19	2	24	-4.9	15.9	2.406		
Pulse	Patients	23	8	36	15.0	14.7	1.933	2.831	1.7
	Controls	18	8	40	19.9	13.8	2.091		

* Pulse records were not obtained in all cases.

† Coefficient of reliability = $\frac{\text{Difference}}{\text{Probable error of difference}}$. This value should equal 3 to be statistically reliable.

difference, however, was not sufficiently large to indicate that the difference was statistically reliable. Likewise, the differences in diastolic blood pressure and pulse rate were not significant. A striking fact noted in connection with diastolic pressure was its tendency either to rise or to fall after the injection of epinephrine. Pulse rate, too, tended to decrease in some instances, but on the whole upward changes predominated.

TABLE 2.—Changes in Blood Pressure and Pulse Following the Intravenous Injection of 0.5 Cc. of Physiologic Solution of Sodium Chloride

		No. of Cases*	Change			Standard Deviation	Probable Error		C. R.
			Mini-mum	Maxi-mum	Mean		Mean	Difference	
Systolic blood pressure	Patients	18	0	26	5.2	8.5	1.349	1.663	0.4
	Controls	18	0	16	-8	4.6	6.1		
Diastolic blood pressure	Patients	18	-2	18	5.6	7.4	1.187	1.727	2.1
	Controls	18	0	14	-10	1.9	7.8		
Pulse	Patients	16	0	20	2.4	8.5	1.433	1.913	0.4
	Controls	17	0	16	-12	1.7	7.5		

* The number of cases does not correspond to that in table 1 because not all subjects received salt solution.

Table 2 shows the changes in blood pressure and pulse rate following the injection of physiologic solution of sodium chloride. All three types of measure tended either to decrease or to increase, although the maximum increases in all instances were greater than the maximum decreases. Differences between the patients and the normal group were negligible and not statistically reliable.

Table 3 shows a comparison of blood pressure and pulse reactions to epinephrine and salt solution. The average change in blood pressure and pulse rate of both the normal and the psychoneurotic groups was strikingly lower after the injection of salt solution than of epinephrine, except for diastolic pressure. The average change in diastolic pressure was greater after salt solution owing to the fact that there were a great many more and larger decreases (negative values) in diastolic pressure after epinephrine, which tended to lower (make less positive) the average change. The coefficients of reliability were so small, however, that the differences in diastolic pressure following the injection of epinephrine and of salt solution cannot be regarded as significant.

In a review of the literature based on studies of subcutaneous injections of epinephrine, Grill³ stated the variations in the epinephrine effect depend on the initial blood pressure and that when this is low one has to reckon with a relatively poor effect. He maintained

TABLE 3.—Comparison of Blood Pressure and Pulse Reaction to 0.5 Cc. of a Solution of Epinephrine (0.01 Mg.) and to 0.5 Cc. of Physiologic Solution of Sodium Chloride

	Average Change		Difference	P. E. Difference	C. R.
	Salt	Epinephrine			
Systolic blood pressure					
Patients.....	5.2	24.3	19.1	2.333	7.5
Controls.....	4.6	18.5	13.9	1.803	7.5
Diastolic blood pressure					
Patients.....	5.6	2.8	2.8	2.381	1.2
Controls.....	1.9	-4.9	6.8	2.793	2.4
Pulse					
Patients.....	2.4	15.0	12.6	2.446	5.1
Controls.....	1.7	19.9	18.2	2.441	7.4

TABLE 4.—Relation of Initial Systolic Blood Pressure to the Maximum Rise Following Intravenous Injection of 0.01 Mg. of Epinephrine

Initial Blood Pressure	Patients		Controls	
	No. of Cases	Maximum Rise	No. of Cases	Maximum Rise
100-109.....	1	0	2	22
110-119.....	5	23	2	22
120-129.....	6	26	7	19
130-139.....	8	21	2	15
140-149.....	3	31	5	15
150-159.....	2	37	1	19
Total.....	25		19	

that the best effect is obtained at the normal blood pressure level and that with increased pressures the effect again is poor. Our study does not confirm this idea.

According to table 4, the maximum rise of systolic blood pressure of psychoneurotic patients following the injection of epinephrine was least when the initial pressure was low and increased directly with an increase in the initial level. The opposite was true in the normal group, the rise of systolic pressure tending to be less as the initial pressure increased. This suggests that some psychoneurotic individuals may be sensitized to epinephrine, owing to its overproduction in the body under emotional conditions.

Table 5 shows the variety of symptoms expressed by the subjects after the administration of epinephrine. Palpitation, weakness and trembling were most commonly described by the patients and sensations of

3. Grill, C.: Observations on the Adrenalin Need in Man and the Effect on the Blood Pressure at Different Blood Pressure Heights. *Acta med. Scandinav.* 91: 628-647, 1937.

warmth by the normal group. The latter also frequently mentioned palpitation, weakness, trembling and breathing difficulties.

In only two instances were similar reactions described after the injection of salt solution. One patient stated that he felt his heart "pumping" and that he was a little excited but not afraid. Another commented on the fast beating of her heart. All other subjects stated that they felt no difference following the injection of salt solution.

It was striking that in thirteen of the twenty-five patients, or more than half, the symptoms following the administration of epinephrine corresponded at least in part to the presenting complaints. Remarks such as the following were made by these patients:

I feel just like this when I get a spell at home.
That's just the way I always feel.
I had this funny feeling in my stomach before.
I have these numb spells anyway.
I feel attacks like this when I go to bed at night.
When I make myself work I feel this way.
I have pain in the right leg like I usually have.
I feel taut on the right side, the same sort of thing as usual, but worse.

My heart flutters like when I feel weak. At those times my heart feels sort of fluttery.

My feelings were on the same order as my first attack.

I have these funny sensations often when I feel weak in the legs and shaky all over.

Perspiring is an ordinary symptom of mine.

I feel weak and trembly, like crying. Ordinarily when I get tired my hands are shaky and I cry.

The close correspondence between the sensations the patients described after injection of epinephrine and their usual psychoneurotic symptoms may be further evidence that the complaints of some psychoneurotic patients are due to the overproduction of epinephrine.

COMMENT

Many "neurotic" symptoms are obviously not purely imagined. The increase in heart rate, perspiration of the palms and spasm of the intestinal musculature are all physiologic reactions, although their etiology may be psychologic. From our observations it appears that epinephrine may be one of the mediating agents of these reactions. Our subjects had no fear of the injection, as evidenced by the small reactions to physiologic solution of sodium chloride and by the lack of subjective complaints following the injection of salt solution. Epinephrine was given "simply as a repetition" of the first injection, and yet the signs and symptoms following it were quite definite.

A coteric of signs and symptoms was common to most subjects, normal or psychoneurotic. These included deep sighs, pallor, palpitation, weakness and trembling. It was interesting to note that the frequency of symptoms produced by epinephrine was roughly the same in normal subjects and psychoneurotic patients, which may be further evidence that most of the symptoms described were not psychic and imagined but were produced by epinephrine.

Another observation was that existing "psychoneurotic" symptoms were markedly aggravated by epinephrine. Many patients a few moments after the injection of epinephrine spoke of "feeling just like this" during a "nervous" attack. The complaints of some patients were general, consisting mainly of weakness and trembling. Others described sensations localized in the stomach, heart, legs and other parts of the body. One patient who complained of "sciatic pain"

which was not present after the injection of salt solution felt the pain acutely for several minutes after epinephrine was injected. This suggests that there may be a locus which when stimulated gives rise to local symptoms. The question arises whether pain and other symptoms of organic origin may not be aggravated by epinephrine. This possibility is now being investigated.

Normally the secretion of epinephrine is sufficient to maintain blood pressure, normal glycogenolysis and other functions, the amount secreted varying with the person and the situation. Because of the relation of the adrenal glands to the autonomic nervous system, the amount of flow presumably is proportionate in some degree to the activity of this part of the nervous system. States of excitement and fear may produce stimulation of the autonomic system, and as the psychoneuroses are associated with obvious or repressed emotional conflict they are likely to produce such stimulation.

No doubt the patient feels his symptoms keenly, and he refuses to believe they are imaginary. He can

TABLE 5.—Frequency of Expressed Symptoms Following Intravenous Injection of 0.01 Mg. of Epinephrine

Symptoms	Patients		Controls	
	No.	%	No.	%
Palpitation (flutter, pounding).....	10	9.3	11	12.5
	10	9.3	9	10.2
	10	9.3	9	10.2
	9	8.4	9	10.2
	8	7.5	13	14.8
	7	6.5	5	5.7
	7	6.5	3	3.4
	6	5.6	0	0.0
	6	5.6	6	6.8
Legs: weak, shaky, light, numb, tense, heavy....	5	4.7	2	2.3
	5	4.7	6	6.8
	5	4.7	3	3.4
	4	3.7	2	2.3
Visual phenomena.....	3	2.8	1	1.1
Pain: leg, head, face.....	2	1.9	3	3.4
Pulsations: abdomen, leg, throat, body.....	2	1.9	2	2.3
Fingers cold.....	1	1.0	1	1.1
Pressure on knees.....	1	1.0	1	1.1
Miscellaneous.....	6	5.6	2	2.3
Total.....	107	100.0	88	99.9

be persuaded, however, to realize that while his symptoms are real and due to autonomic stimulation they are a part of his emotional reaction.

SUMMARY

1. The systolic blood pressure and pulse reactions of both psychoneurotic and normal persons are significantly greater following the intravenous injection of epinephrine than of salt solution. A similar difference in diastolic blood pressure was not observed.

2. The differences in blood pressure and pulse reactions between normal and psychoneurotic persons following intravenous injection of epinephrine are not statistically reliable.

3. The diastolic blood pressure tends to fall as often as it rises after the intravenous injection of epinephrine.

4. Epinephrine administered intravenously in dosage sufficient to produce changes in blood pressure and pulse rate produces similar signs and symptoms in normal and in psychoneurotic persons. These symptoms are similar to those commonly described by psychoneurotic patients.

5. Epinephrine aggravates existing psychoneurotic symptoms and may activate given latent symptoms.

6. From the therapeutic point of view, a patient will accept the fact that his symptoms are organic and not imaginary, although their basis may be psychologic.

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PROGNOSIS IN SCHIZOPHRENIA

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Schizophrenia is a major medical and economic problem. Twenty-one years ago Pollock said:

If some unknown disease should strike down and kill 1,000 young people in New York City during the current year, do you think the medical profession, the newspapers, and the public generally would view the matter with complacency? Yet dementia praecox will come into this city as a masked enemy and steal away the minds of 1,000 young men and women and condemn them to a living death this year . . . and scarcely no public mention of the matter will be made.

A true rebirth phenomenon has insidiously manifested itself during the past half decade. It has been given impetus by the report of Meduna on the convulsive treatment of schizophrenia through the use of pentamethylenetetrazol (metrazol, cardiazol). The results achieved by Sakel using insulin as a method of inducing pharmacologic shock received wide publicity.

The great attention focused by these forceful attacks on a recalcitrant syndrome has been of inestimable value in an unforeseen direction, for regardless of the validity

TABLE 1.—First Admissions (339)

	Type											
	Simple		Hebe- phrenic		Cata- tonic		Para- noid		Total			
Sex.....	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Total number of cases.....	17	4	44	40	31	39	101	62	193	146		
Percentage paroled and discharged.....	65	75	32	33	55	65	44	36	45	43		
Combined percentage paroled and discharged, both sexes..	67		32		59		41		44			

and worth of the pharmacologic shock as therapy that technic has attracted long needed allies to the side of psychiatry in its struggles to elucidate the nature of schizophrenia. The biochemist, the physiologist and the pharmacologist, long protesting against the esoteric and impalpable material of psychology, allowed themselves a taste and now want a bite.

Psychiatry is not fixed. Its tenets shift gradually, and its criteria change with time. Standards used two decades ago are now discarded. To measure anything one must have a standard of comparison. The worth of the pharmacologic shock treatment in schizophrenia can be adjudged only with a greatly increased number of cases, accompanied by adequate controls, observed over a long period of time.

With this goal in mind I undertook to study all the cases of schizophrenia admitted during one fiscal year to the Rockland State Hospital for two reasons: first, because of the need for controls for comparative purposes in the pharmacologic shock group and, secondly, because I wished to evaluate the work done at this hospital. The hospital receives patients committed from New York City (boroughs of Manhattan, Bronx and Richmond) and the county of Rockland.

The year 1935 was picked for these reasons: (1) There was a change in the New York State Department of Mental Hygiene Statistical Guide, with the introduction of a new classification approved by the American Psychiatric Association in 1934, which par-

tially invalidated the old New York State statistics for the comparative purposes necessary; (2) this year antedates the introduction of the shock treatment at Rockland; (3) it offers a good statistical sampling, for there are more than 500 cases, and (4) all the diagnoses at Rockland during that year were made by one man.

RESULTS

In a total of 536 cases admitted during the year there were twenty deaths due to extraneous causes and twenty-five transfers into and out of the hospital. Of

TABLE 2.—Readmissions (152)

Sex.....	Type										Total
	Simple		Hebe- phrenic		Cata- tonic		Para- noid		Total		
	♂	♀	♂	♀	♂	♀	♂	♀			
Total number of cases.....	5	4	23	20	15	22	31	32	71	78	
Percentage paroled and discharged.....	80	50	22	35	33	27	52	34	43	48	
Combined percentage paroled and discharged, both sexes..	67		28		30		43		57		

the remaining 491, 339 were first admissions and 152 were readmissions; the latter had been admitted to hospitals other than Rockland or had previously been admitted to this hospital. The patients are grouped by type and sex as follows: simple type, twenty-three males and eight females; hebephrenic type, seventy-one males and sixty-seven females; catatonic type, fifty-three males and sixty-six females; and paranoid type, 144 males and 103 females. In addition, there was one female with a mixed type of the disease.

Thus there is a slight preponderance of males over females except in the catatonic type. In all there were 291 males against 245 females. The most frequent type encountered is the paranoid, followed in order by the hebephrenic, catatonic and simple types.

The syndrome strikes youth. The average age on admission for thirty-one patients with simple schizophrenia, was 26.8 years; for 138 with the hebephrenic, 25.6 years; for 119 with the catatonic type, 25.9, and for 247 with the paranoid, 33.5 years. Thus the oldest group is the paranoid and the youngest the hebephrenic.

TABLE 3.—First Admissions and Readmissions (491)

Sex.....	Type								Total
	Simple		Hebe- phrenic		Cata- tonic		Para- noid		
	♂	♀	♂	♀	♂	♀	♂	♀	
Total number of cases.....	22	8	67	60	46	61	122	91	257
Percentage paroled and discharged.....	68	63	28	33	48	49	46	35	41
Combined percentage paroled and discharged, both sexes..	67		31		49		41		41

The length of time the patients were noticeably psychopathic is of interest. It is found that those with the paranoid type are able to adjust themselves in the outside world the longest. The patient with the catatonic type is hospitalized soonest after onset, followed by the hebephrenic and simple types. The duration of illness in days before hospitalization for first admissions alone is 694 for the simple type and 593 for the hebephrenic, 519 for the catatonic and 712 for the paranoid type. Readmission for the catatonic type occurs very soon after exacerbation of the illness.

A study of the average length of hospital stay from admission to parole in cases in which remission occurs

From the Rockland State Hospital, Orangeburg, N. Y.
Read in part before the Interhospital Conference of the New York State Hospitals at the Psychiatric Institute and Hospital, New York, April 8, 1938.

shows that the longest hospitalization results from catatonia and the shortest from simple schizophrenia. The average hospitalization in days of paroled patients is simple type 212, hebephrenic type 270, catatonic type 329 and paranoid type 225.

The tables show the number and percentage distribution of the paroled and discharged patients in the various types for first admissions alone, readmissions alone and for the two groups together. One is struck in table 1 by the very high parole rate among first admissions, for an average for all types and for both sexes of 44 per cent is paroled. Noteworthy is the astonishing percentage of paroles and discharges in the catatonic groups, with 65 per cent and 55 per cent of females and males respectively improving sufficiently to go home, and this without special treatment. The simple type also shows a high rate, but the number of cases is less. The hebephrenic rate fits in with the conception of the more serious and refractory nature of this reaction type, for this group has the lowest parole rate, while the paranoid type is next. Table 2 shows that the parole rate for readmitted cases of the catatonic type has dropped and is next to the lowest, closely approximating the hebephrenic type, which maintains its negative leadership. The simple type remains highest and the paranoid type is in about the same position as for first admissions. Table 3 combines the preceding two tables: the simple and catatonic types offer the best prognosis, closely followed by the paranoid type, the hebephrenic type being left far behind, in accordance with preexisting concepts.

The question of how many persons have previously been patients and have been paroled or discharged before may be brought up. It is found that of both sexes 28 per cent of all those discharged and paroled had previously been admitted for this condition; the remainder had been hospitalized for the first time.

SUMMARY

1. The most frequent reaction type encountered in this study is the paranoid, followed in order by the hebephrenic, catatonic and simple types.
2. The oldest group is the paranoid, the youngest the hebephrenic type.
3. The catatonic type is hospitalized most quickly after onset; then follow the hebephrenic and simple types; the patients of the paranoid type are able to adjust the longest with their psychoses.
4. In cases of readmission, the longest hospital stay results from catatonia, the shortest from simple schizophrenia.
5. Among first admission only, 67 per cent of the simple type, 59 per cent of the catatonic, 41 per cent of the paranoid and 32 per cent of the hebephrenic type are paroled. This is an average of 44 per cent for all types.
6. Among readmissions only, 67 per cent of the simple type, 43 per cent of the paranoid, 30 per cent of the catatonic and 28 per cent of the hebephrenic type are paroled, an average of 37 per cent.
7. The prognosis for second attacks is poorer.
8. The prognosis in simple schizophrenia is best; the catatonic type has a relatively good outlook for the first attack and a poor one for subsequent episodes, approaching the uniformly poor prognosis held out for the hebephrenic type. Patients with paranoid schizophrenia have a fair outlook, unchanged by previous hospitalization. These patients do not deteriorate so rapidly as the catatonic and hebephrenic types, and so their parole rate is constant.

9. The best ultimate prognosis is held by the simple and catatonic types, followed by the paranoid and lastly by the hebephrenic type.

10. Of all those paroled or discharged, 72 per cent had only one admission and 28 per cent were paroled more than once.

CONCLUSIONS

The prognosis in schizophrenia is not so hopeless as is generally believed. Among patients on their first admission in this study, 44 per cent remitted spontaneously and were able to return to their homes.

Although the results reported with pharmacologic shock treatment are, so far, decidedly favorable, especially as far as it seems to cut down the length of hospital stay before remission in early cases, psychologic implications must not be overlooked. A deep regression occurs during stupor or convulsion out of which a new environmental adaptation follows. The intensified relation of patient to physician and added nursing care may be the factors which promote rapid remission.

It must not be forgotten, as the previous figures show, that spontaneous remission is as frequent or almost as frequent as pharmacologically induced remission.

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GASTRIC PERISTALSIS AFTER PYLO- ROTOMY IN INFANTS

WITH SPECIAL REFERENCE TO POSTOPERATIVE
CARE OF PYLORIC STENOSIS

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For nearly a quarter of a century it has been customary in postoperative management of infants who have undergone the Fredet-Rammstedt operation of pylorotomy for hypertrophic pyloric stenosis to begin the administration of water and milk very soon after operation and to repeat it at frequent intervals. Morgan,¹ the first to outline the treatment in detail, advised giving 16 cc. of water one hour after operation, following it with 16 cc. of slightly diluted breast milk an hour later and thereafter alternating water and milk in gradually increasing amounts about every one and one-half hours. Strachauer² begins feeding from three to four hours after operation. Paterson³ begins at four hours, giving 4 cc. hourly and gradually increasing the amount. Page⁴ begins an hour or two after operation. Lanman and Mahoney⁵ begin at two hours with water and repeat at two hour intervals, later using whey and breast milk. Norris,⁶ however, gives nothing by mouth for six hours but then gives 15 cc. of breast milk every thirty minutes for four hours. Cobb⁷ gives water immediately after recovery. Thompson and Gaisford⁸

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1. Morgan, E. A.: Postoperative Management of Pyloric Stenosis, *Am. J. Dis. Child.* 11: 245 (March) 1916.

2. Strachauer, A. C.: Congenital Hypertrophic Pyloric Stenosis, *Ann. Surg.* 85: 67 (Jan.) 1927.

3. Paterson, Donald: After-Care of Congenital Pyloric Stenosis, *Brit. M. J.* 2: 1176 (Dec. 26) 1931.

4. Page, C. M.: Congenital Pyloric Stenosis, *Brit. M. J.* 2: 691 (Oct. 17) 1931.

5. Lanman, T. H., and Mahoney, P. J.: Congenital Hypertrophic Stenosis of the Pylorus, *Surg., Gynec. & Obst.* 56: 205 (Feb.) 1933.

6. Norris, W. J.: Congenital Hypertrophic Pyloric Stenosis, *West. J. Surg.* 41: 377 (July) 1933.

7. Cobb, D. R.: Congenital Hypertrophic Pyloric Stenosis, *South. Surgeon* 3: 140 (June) 1934.

8. Thompson, W. A., and Gaisford, W. F.: Congenital Pyloric Stenosis, *Brit. M. J.* 2: 1037 (Nov. 30) 1935.

give 8 cc. of water two hours after operation and alternate formula and water thereafter at two hour intervals. Donovan⁹ starts water at two hours, gives 8 cc. of milk at four hours and follows with milk at three hour intervals thereafter. Harris,¹⁰ like Norris, gives nothing by mouth for the first six hours and then gives 4 cc. of breast milk every hour. Rowe¹¹ starts water two hours after operation and repeats it every fifteen minutes; he starts milk at eight hours and repeats it at three hour intervals. Holt and Howland¹² advise starting with from 5 to 10 cc. of breast milk as soon as the infant recovers from the anesthetic, repeating it every three hours and giving water between feedings.

Griffith and Mitchell¹³ start water or sugar solution "a few hours" after operation and milk at six or eight hours. Parmelee¹⁴ starts with 8 cc. of Ringer's solution and dextrose as soon as the infant is awake and repeats every two hours; an hour after the first solution, 15 cc. of breast milk is given and also repeated every two hours; thus the infant receives solution or

laparotomy for other diseases and that the usual conservative rule of giving water very sparingly immediately after operation and no food for the first twenty-four hours must be disregarded. The conservative practice is based on a desire to minimize postoperative vomiting and on recognition of the fact that after operations on the abdominal organs normal peristalsis is often temporarily suspended, so that, even when not vomited, ingested material in the stomach will not be passed on into the intestine and absorbed. That postoperative vomiting after pylorotomy is frequent and often troublesome was noted by Morgan and other writers and has certainly been our own experience when following the usual schedule of early and frequent feedings. We were led by this observation to wonder whether the condition of temporary inhibition of peristalsis might not occur after pylorotomy as well as after other abdominal operations and, if so, whether the classic method of postoperative management of pylorotomy is altogether wise.

Postoperative Rates of Gastric Emptying *

Case No.	Barium Sulfate Given, Hours	Complete Retention Last Noted, Hours	Emptying First Noted, Hours	50-80% Retention, Hours	10-40% Retention, Hours	Practically Complete Emptying First Noted, Hours	Comment
1	2	7	10 (90%)	24 (50%)	..	..	Not examined after 24 hours
2	Before operation	24	..	..	..	25	Amount of barium sulfate small
3	2	3	5	7 (67%)	13 (±10%)	26	A few drops still in stomach at 23½ hours
4	±1	10	..	..	..	20	One drop still in stomach at 20 hours
5	5	8	14	..	24 (33%)	26½	A trace still in stomach at 26½ hours
6	4½	5	..	..	17 (40%)	23	No examination between 5 and 17 hours
7	5	11½	18 (90%)	26½ (50%)	..	29½	Small amount still in stomach at 29½ hours
8	2	8	18 (60%)	..	24 (30%)	48	No examination between 24 and 48 hours
9	2	3	4 (93%)	..	16 (40%)	22	
10	2	6½	9½	19 (80%)	..	24	

* The stated hours are dated from the time of operation. The percentages indicate the amount of retention as estimated by the roentgenologist.

milk every hour. Wyatt¹⁵ gives 15 cc. of water two hours after operation and 15 cc. of milk two hours later; the alternation is continued during the first day. The total amount of fluid plus milk (usually breast milk) for the first twenty-four hours has been estimated by us to range from 4 ounces (120 cc.) to 16 ounces (480 cc.) and the time of first administration from about half an hour to six hours after operation. The intervals between feedings of water or breast milk range from fifteen minutes to two hours. These intervals, it should be noted, are much shorter than those ordinarily used in the feeding of babies.

It is evident that practically all writers on the subject believe that much earlier oral administration of fluid and food is required after pylorotomy than after

For these reasons we have determined the rate and extent of gastric emptying during the period immediately following operation in ten cases. The operation in all instances was the standard Fredet-Rammstedt. From one to five hours after the infant returned from the operating room a teaspoonful of barium sulfate, suspended in an ounce of water, was given by mouth. Periodic examination at convenient intervals were made by fluoroscopy and roentgenograms for from twenty-four to forty-eight hours until the stomach was empty or practically so. Nothing else was given by mouth in most of the cases until that point had been reached, the fluid needs being met by hypodermoclysis. The accompanying table gives the results of the inquiry.

Omitting case 2, in which barium sulfate was not fed after operation, it will be observed that complete retention lasted from three to eleven and one-half hours (average, nine cases, 8.9 hours), that emptying was first noted from five to eighteen hours after operation (average, seven cases, 11.2 hours), and that emptying was not complete until from twenty to twenty-nine and one-half hours after operation (average, nine cases, counting the emptying time in cases 1 and 8 as twenty-five hours, 24.5 hours). Attention is called especially to cases 1, 5 and 8, in which from 30 to 50 per cent of the ingested barium sulfate remained in the stomach twenty-four hours after operation.

9. Donovan, E. J.: *Congenital Hypertrophic Pyloric Stenosis*, J. A. M. A. 109: 558 (Aug. 21) 1937.

10. Harris, Charles: *Congenital Hypertrophic Pyloric Stenosis*, St. Bartholomew's Hosp. Rep. 70: 43, 1937.

11. Rowe, O. W.: *Congenital Hypertrophic Pyloric Stenosis*, Minnesota Med. 20: 508 (Aug.) 1937.

12. Holt, L. E., and Howland, John: *Holt's Diseases of Infancy and Childhood*, ed. 10, New York and London, D. Appleton-Century, Inc., 1936, pp. 280-281.

13. Griffith, J. P. C., and Mitchell, A. G.: *The Diseases of Infants and Children*, ed. 2, Philadelphia and London, W. B. Saunders Company, 1937, p. 542.

14. Parmelee, A. H.: *Diseases of the Esophagus and Stomach*, in Brennemann, Joseph: *Practice of Pediatrics*, Hagerstown, Md., W. F. Prior Company, Inc., 1938, vol. 3, chapter 5, p. 15.

15. Wyatt, O. S.: *Hypertrophic Pyloric Stenosis*, Journal-Lancet 59: 233 (May) 1939.

GASTRIC PERISTALSIS—FABER AND DAVIS

Protocols of the individual cases are given at the end of the paper.

COMMENT

It is clear that after pylorotomy for infantile pyloric stenosis gastric peristalsis is completely inhibited for several hours and is much depressed for twenty-four hours or more. Case 5 is of special interest in showing how long it may require to return to normal. This is the only case in which we had subsequent barium sulfate tests after the first day; these showed that on the third postoperative day emptying was still slow while on the twentieth day it was quite normal.

The peristaltic depression after operation is, we believe, closely related to postoperative vomiting and distention and, having demonstrated it, we believe that the schedule of early postoperative feeding now in general use should be revised. It may well cause or increase vomiting or lead to unfortunate degrees of distention in stomachs already dilated by the preexisting obstruction. Certainly much of the ingested fluid and food is not useful to the patient, being either vomited or retained in the stomach, from which it cannot be absorbed.

For these reasons we have adopted the policy of withholding both water and food for about twenty-four hours after operation and of administering fluid parenterally during that time and usually also on the next day. On the second day we offer an ounce (30 cc.) of breast milk or formula every four hours, and on successive days we rapidly increase the amount up to the normal for size and need. With formula-fed babies we often employ thick cereal feedings at first, diluting them after a day or two or changing to ordinary fluid formulas. Under this plan of management vomiting, although not entirely eliminated, has been considerably lessened, and no serious postoperative difficulties have been encountered.

It may be pointed out that today infants with pyloric stenosis rarely come to the pediatrician and surgeon in the state of extreme malnutrition and dehydration which was so common a few years ago and which made the administration of food and fluid by mouth at the earliest possible moment seem exceptionally urgent. This was probably the basis for what now seems to us an undue haste in postoperative feeding. It appears not unreasonable that in the future the same general policy of postoperative feeding should be used after pylorotomy for pyloric stenosis as after laparotomy for other diseases.

CONCLUSIONS

1. After pylorotomy for hypertrophic pyloric stenosis there is a profound and prolonged depression of gastric peristalsis, which regularly lasts for about twenty-four hours and may last three or more days. In the average case evacuation of material ingested soon after operation does not begin for over eight hours and is not complete until twenty-four hours after operation. In our opinion this depression of peristalsis is closely related to postoperative vomiting, which is common and often persistent for several days after the Fredet-Rammstedt operation.
2. For these reasons the traditional early and frequent administration of water and food during the first postoperative day does not seem either logical or desirable, nor is the reason apparent why it should be considered urgent. It is suggested that the same general plan of postoperative management should be applied to pylorotomy as to other abdominal operations, food being withheld for about a day and water given very sparingly at first.

PROTOCOLS

The preoperative symptoms and signs were typical in all cases, and the diagnosis of hypertrophic pyloric stenosis was confirmed at operation.

CASE 1.—A boy aged 4 weeks was given barium sulfate mixture two hours after operation. Examinations three, five and seven hours after operation showed that no barium sulfate had left the stomach. At ten hours not over 10 per cent was out. At twenty-two hours the stomach was almost half empty. At twenty-four hours there was still 50 per cent retention; this was the last examination. Administration of water by mouth was begun at twenty-six hours and of formula at thirty-three hours. There was no postoperative vomiting.

CASE 2.—A boy aged 3 months had been given barium sulfate a few hours before operation, and no additional barium sulfate was given afterward. Examinations at frequent intervals after operation showed no peristaltic activity of the stomach for twenty-two hours. At twenty-four hours he was given 1 ounce (30 cc.) of thick formula. At twenty-five hours most of the barium sulfate had left the stomach and a peristaltic wave was seen for the first time.

CASE 3.—A girl 1 month old was given barium sulfate two hours after operation. Three hours after operation no peristalsis and no emptying were seen. At five hours a few drops had left the stomach. At seven hours the stomach was one-third empty; at thirteen hours the stomach was almost empty, and at twenty-three and a half hours only a few drops remained in the stomach near the pylorus. None at all remained at twenty-six hours. Feeding of thick cereal formula was begun at twenty-four hours, and the food was retained.

CASE 4.—A boy aged 1 month was given barium sulfate five hours after operation. Emptying had not occurred six and a half and eight hours after operation. It was first seen at fourteen hours, and at twenty-four hours the stomach was two-thirds empty. At twenty-six and a half hours a trace was still present. At this time liquid formula was given but was vomited. Thick cereal formula was retained.

CASE 4.—A boy aged 1 month was given barium sulfate shortly after operation. None had passed out of the stomach at two, six and ten hours. At twenty hours only a drop remained. Thick cereal feeding was started twenty-six hours after operation, and the food was retained.

CASE 5.—A boy aged 3 weeks was given barium sulfate five hours after operation. No emptying had occurred six and a half and eight hours after operation. Evacuation had begun at fourteen hours, and the stomach was only two-thirds empty at twenty-four hours. At twenty-six and a half hours a trace remained in the stomach. Fluid formula given at this time was vomited. Thick cereal (1 ounce) was given and retained. A second barium sulfate test was made two days later. One fourth of the amount ingested had left the stomach at two hours and 50 per cent at four and a half hours, and the stomach was then emptying rapidly. Twenty days after operation a third test showed normal peristalsis; 50 per cent of the barium sulfate had emptied at one hour and none was left in the stomach at four hours.

CASE 6.—A boy aged 7 weeks was given barium sulfate four and a half hours after operation. There was no emptying half an hour later. At seventeen hours 40 per cent of the barium sulfate still remained in the stomach. At twenty-three hours emptying was complete. Formula given at twenty-three hours was retained.

CASE 7.—A boy aged 1 month was given barium sulfate five hours after operation; none had left the stomach half an hour or eleven and a half hours after operation. At eighteen hours there was still almost 90 per cent retention and at twenty-six and a half hours 50 per cent. At twenty-nine and a half hours a small amount of barium sulfate still remained in the stomach. Formula was started at twenty-six hours, and for the first few feedings small amounts were vomited.

CASE 8.—A boy aged 1 month was given barium sulfate two hours after operation. None had left the stomach eight hours after operation. At eighteen hours 60 per cent

in the stomach and at twenty-four hours 30 per cent. At forty-eight hours, the time of the next examination, the stomach was empty. Feeding was begun at forty-eight hours. Some vomiting occurred.

CASE 9.—A girl aged 3 weeks was given barium sulfate two hours after operation. Three hours after operation none had left the stomach and four hours after only 5 per cent. At sixteen hours 40 per cent remained in the stomach. At twenty-two hours emptying was complete. Fluid formula given at twenty-four hours was vomited, but thick cereal was retained.

CASE 10.—A boy aged 6 weeks was given barium sulfate two hours after operation. Emptying had not occurred three and a half and six and a half hours after operation and was first noted at nine and a half hours. At nineteen hours 80 per cent was still in the stomach. At twenty-four hours the stomach was empty.

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STUDIES ON PRESERVED HUMAN BLOOD

I. VARIOUS FACTORS INFLUENCING HEMOLYSIS

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The current interest in the use of preserved human blood for transfusions has been especially motivated by economic pressure in the United States and by military necessity in Europe. Hence the empirical clinical use of transfusions of preserved blood has tended to precede rather than to follow fundamental objective biologic and chemical studies in the laboratory.

A review of the literature reveals few data from which the clinician can establish satisfactory criteria for the use or rejection of preserved blood. Two factors appear to have contributed to this paucity of laboratory observations: first, the practice of blood transfusion has been so extensive and the indications have been so diverse that it is often difficult for the clinician to define precisely which elements of the transfused blood he most desires his patient to receive; second, the exact mechanism of the production of the various reactions from blood transfusions is not well understood. Consequently evaluation of the relative merits of fresh and preserved blood has been inordinately delayed.

There is considerable evidence that the intravenous injection of a large amount of hemolyzed blood may result in death, but the exact relation of hemoglobin to the production of severe transfusion reactions has not been determined. There is an apparent correlation between the occurrence of hemolysis in vivo and the incidence of severe renal damage, but whether the lesions of the kidneys are the result of the action of free hemoglobin itself or are caused by some other factor released by disintegration of the erythrocytes has not been conclusively determined. For a detailed statement of this aspect of the problem, the reader is referred elsewhere.¹ It is proposed until further studies are made

that preserved blood be considered unfit for transfusion if the hemoglobin content of the plasma is such that hemoglobinuria appears after the blood has been transfused.

In blood preserved by any technic the most obvious change occurs in the supernatant plasma, which sooner or later assumes the color of hemoglobin. It is not yet definitely established whether the erythrocyte must first rupture to give off its hemoglobin or whether it is possible for the pigment to diffuse out through small apertures in the cell membrane. Whatever the mechanism involved, the amount of free hemoglobin in the plasma of preserved blood may serve as a simple index of its suitability for use in transfusions and has consequently been used extensively for this purpose. Lichty, Havill and Whipple² have shown that there is a renal threshold for hemoglobin in the dog; more recently Ottenberg and Fox³ demonstrated a similar mechanism in human beings.

Rous and Turner⁴ in 1916 published the basic studies on the preservation of blood cells. They demonstrated that in general the rapidity of hemolysis is increased by the addition of electrolytes to the blood preservative mixture. On the contrary, when the serum was diluted with saccharose or dextrose the rate of hemolysis was much diminished. They devised a mixture consisting of three volumes of blood, two volumes of 3.8 per cent sodium citrate ($\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 + 5\frac{1}{2}\text{H}_2\text{O}$) in water and five volumes of 5.4 per cent dextrose which kept human red cells intact for four weeks. It was used to some extent in the British Medical Corps during the World War.⁵ In addition to the large volume this mixture had the disadvantage that the concentration of sodium citrate was too high for safe intravenous administration. Consequently the supernatant plasma was discarded and the cells were resuspended in saline or Locke's solution before being transfused.

In 1926 Perry⁶ reported extensive observations on the storage of blood with a dextrose-lithium citrate mixture which served as an excellent preservative. As with the Rous-Turner mixture, it was necessary to discard some of the plasma because of the high concentration of citrate. The use of lithium citrate merits further investigation. The workers at the Moscow Institute of Hematology later devised a mixture which has been widely used and which consists of sodium chloride 7.0 Gm., sodium citrate 5.0 Gm., potassium chloride 0.2 Gm. and magnesium sulfate 0.004 Gm. in 1,000 cc. of water. To this is added an equal volume of blood. Lindenbaum and Stroikova,⁷ at the Leningrad Research Institute for Blood Transfusion, compared this mixture with citrated blood and with the Rous-Turner mixture and concluded that the Moscow mixture inhibited hemolysis no better than did sodium citrate and not nearly as well as did the Rous-Turner mixture.

Gnoinski,⁸ of Warsaw, recently reported the successful preservation of blood in ampules from which the

2. Lichty, J. A.; Havill, W. H., Jr., and Whipple, G. H.: J. Res. 1932. Thresholds for Hemoglobin in Dogs, *J. Exper. Med.* 55: 603-615 (Aug.) 1932.

3. Ottenberg, Reuben, and Fox, C. L., Jr.: Rate of Removal of Hemoglobin from the Circulation and Its Renal Threshold in Human Beings, *Am. J. Physiol.* 122: 516-525 (Aug.) 1938.

4. Rous, Peyton, and Turner, J. R.: The Preservation of Living Blood Cells in Vitro: I. Methods of Preservation, *J. Exper. Med.* 22: 219-237 (Feb.) 1916.

5. Robertson, O. H.: Transfusion with Preserved Red Blood Cells, *Brit. M. J.* 1: 691-695 (June 22) 1918.

6. Perry, M. C.: Preservation of Blood for Transfusion, *Wiener M. J.* 25: 123-127 (March) 1926.

7. Lindenbaum, J., and Stroikova, X.: Laboratoriumsuntersuchungen über die Entstehungsbedingungen der Hämolyse im konservierten Blut, *Deutsche Ztschr. f. Chir.* 243: 727-735 (Oct. 19) 1934.

8. Gnoinski, H.: Les modifications du sang conservé pendant plusieurs semaines et son effet thérapeutique, *Sang* 12: 820-831, 1935.

From the Departments of Internal Medicine and Obstetrics and Gynecology, State University of Iowa College of Medicine.
1. DeGowin, E. L.; Osterhagen, H. F., and Andersch, Marie: Renal Insufficiency from Blood Transfusion: I. Relation to Urinary Acidity, *Arch. Int. Med.* 59: 432-444 (March) 1937. DeGowin, E. L.; Warner, E. D., and Randall, W. L.: Renal Insufficiency from Blood Transfusion: II. Anatomic Changes in Man Compared with Those in Dogs with Experimental Hemoglobinuria, *ibid.* 61: 609-630 (April) 1938. DeGowin, E. L.: Grave Sequelae of Blood Transfusions: A Clinical Study of Thirteen Cases Occurring in 3,500 Blood Transfusions, *Ann. Int. Med.* 11: 1777-1791 (April) 1938.

air was excluded. He stated that the blood was "good" for ninety days. Scrutiny of the case histories of his six human recipients, however, reveals the fact that after transfusion two patients had fever and hemoglobinuria, three others had fever and only one had no transfusion reaction, and she received but 30 cc. of blood.

In reviewing all the experimental studies, one is impressed by the lack of quantitative data on hemolysis which makes exact comparison impossible. Although Rous and Turner pointed out that the presence or absence of hemolysis in sedimented blood could be determined only by examining the plasma after the cells had been resuspended and centrifuged out, many of the workers have not taken into account this slow diffusion of hemoglobin from the cell layer into the plasma. Practically all observers of hemolysis have used a grading system of 1 to 4 plus or no grading system at all. The only exception to this statement was found in the work of Scudder, Drew, Corcoran and Bull,⁹ and there the hemoglobin estimations were published incidentally to studies of plasma potassium. Statements are frequently made that blood can be preserved for a given length of time, although no acceptable quantitative data are presented to indicate the amount of actual hemolysis. Other than direct estimations of the amount of hemoglobin in the supernatant plasma are obviously valueless.

The object of the studies here reported was to determine the rates of hemolysis occurring in human blood in various preservatives and stored under a variety of conditions.

GENERAL METHODS

In the majority of the experiments the general procedure was the same. Erlenmeyer flasks of pyrex glass of from 1,000 to 1,500 cc. capacity were autoclaved with appropriate amounts of the preservative to be studied. When dextrose solutions were to be combined with other chemicals, the former were heated separately to avoid caramelization and later combined with the latter aseptically. Blood was drawn into the flasks from the median basilic veins of healthy men in quantities of from 400 to 600 cc. The blood was mixed with the preservative by gentle rotation of the receiving flasks. A 16 gage needle was used and connected to the flask by a 15 inch section of gum rubber tubing. Before the cells settled, the entire mixture was apportioned in 50 cc. quantities into 250 cc. Erlenmeyer flasks closed with cotton plugs. The entire lot was stored under identical conditions, and when an analysis was to be made the entire contents of one small flask were thoroughly shaken and the cells were centrifuged out. The supernatant plasma was then pipetted off and analyzed for hemoglobin. This procedure insured a uniform dilution of blood and preservative throughout the entire experiment and obviated the difficulties attendant on sampling the same flask repeatedly.

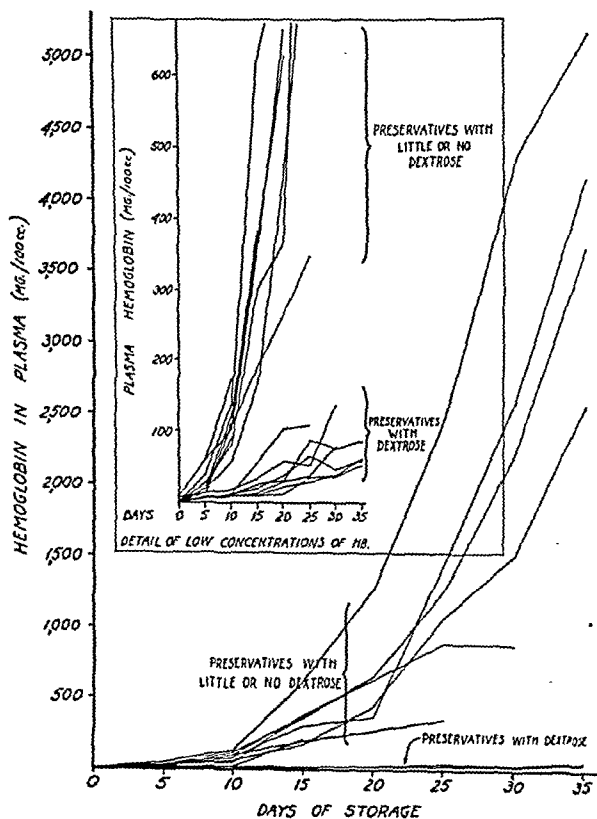
The refrigerator used was a room cooled by open coils of salt brine. The temperature was maintained at from 3 to 5 C. by an electrically controlled thermostat. Continuous records of the temperature were kept. The frost on the open refrigeration coils insured a high relative humidity and thus a minimum of evaporation.

Special precautions were taken to keep the blood away from sunlight or from prolonged exposure to artificial light.

In designing all preservatives an attempt was made to use isotonic solutions as determined by their depressions of freezing point. The freezing point of blood serum was taken as -0.56°C .

The following solutions were used in preservatives: 5.4 per cent anhydrous dextrose U. S. P. (Merck & Co., Inc.) in distilled water, 5.4 per cent anhydrous dextrose (Eastman Kodak Company) in distilled water, 3.2 per cent sodium citrate (Merck reagent grade, $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 + 2\text{H}_2\text{O}$) in distilled water, 0.95 per cent sodium chloride U. S. P. in distilled water and heparin (Connaught Laboratories) in distilled water (sterilized by Berkefeld filtration).

Several methods of estimation of small amounts of hemoglobin were tried before final adoption of the method of Wu.¹⁰ This is a quantitative application of



Plasma hemoglobin values in blood mixtures stored in cotton-plugged flasks at 5 C. The values have been recalculated for differences in dilution when necessary to make them all comparable. The inset magnifies the details of the lower values by increasing the scale of the ordinates.

the benzidine test for hemoglobin in which a brown compound is compared in the colorimeter with a similar color developed in a standard hemoglobin solution. It was found possible to estimate accurately amounts as small as 1 mg. of hemoglobin in 100 cc. of plasma. No interfering substances were encountered in this test. Modifications of Wu's method were tried and found to possess no advantages over the original.

RATES OF HEMOLYSIS IN VARIOUS PRESERVATIVES

Preliminary experiments with the Rous-Turner mixture were sufficient to confirm the observations of those authors. The mixture used contained three volumes of blood, two volumes of 3.2 per cent sodium citrate (dihy-

⁹ Scudder, John; Drew, C. R.; Corcoran, D. R., and Bull, D. C.: Studies in Blood Preservation, J. A. M. A. 112: 2263-2271 (June 3) 1939.

¹⁰ Wu, Hsien: Studies in Hemoglobin: III. An Ultra-Micro-Method for the Determination of Hemoglobin as a Peroxidase, J. Biochemistry 2: 189-194 (Jan.) 1923.

dric)¹¹ in water and five volumes of 5.4 per cent dextrose in water. This mixture contains a total concentration of sodium citrate of 0.64 per cent, which is considered too high to administer intravenously. Another disadvantage is that to give 500 cc. of blood a total mixture of 1,666 cc. would be required.

Modifications of this mixture were tried, and the one finally adopted contained ten volumes of blood, thirteen volumes of 5.4 per cent dextrose in water and two volumes of 3.2 per cent sodium citrate (dihydric) in water. This mixture has a total concentration of 0.25 per cent sodium citrate and provides a total volume of 1,250 cc. as a vehicle for 500 cc. of blood. The concentration of citrate is so low that the modified mixture, unlike the original Rous-Turner mixture, can be safely administered intravenously without discarding the plasma.

A series of experiments was performed with four different preservatives: ten volumes of blood, thirteen volumes of 5.4 per cent dextrose in water and two volumes of 3.2 per cent dihydric sodium citrate in water; thirty-three volumes of blood, four volumes of

of hemolysis were uniformly low during the first ten days, but between the tenth and the fifteenth day there was a sharp increase in the rate of hemolysis in the mixtures containing little or no added dextrose, while in the presence of a high concentration of the sugar hemolysis proceeded more slowly. At the end of from thirty to thirty-five days of storage there was from twenty-five to fifty times as much hemolysis in the mixtures poor in dextrose. This is graphically presented in the accompanying chart. It is hard to translate determined hemoglobin values into gross color changes but we have repeatedly noted that plasma in a test tube 20 mm. in diameter must contain at least 10 mg. of hemoglobin per hundred cubic centimeters before it is visible as a faint pink discoloration. Greater concentrations are difficult to estimate by direct inspection, even for those who have had practice comparing their gross visual judgments with quantitative estimations. Plasma containing 100 mg. of hemoglobin per hundred cubic centimeters is distinctly tinged with red but would probably be considered suitable for transfusion by the average worker.

TABLE 1.—Effect of Various Preservations on Hemolysis*

Experiment No.	Donor	Preservative, Volumes						Hemoglobin in Plasma, Mg. per 100 Cc.								
		Blood	Dextrose	Citrate	Sodium Chloride	Heparin	Dilution Factor†	Days of Storage								
								0	5	10	15	20	25	30	35	
2	Wi.	23	..	2	..	..	× 0.33	1	8	70	174					
14	Nt.	23	..	2	..	..	× 0.33	1	19	57	165	460	1,060	1,503	2,556	
15	Hy.	23	..	2	..	..	× 0.33	1	27	120	353	661	1,233	2,223	3,066	
3	Wi.	10	..	2	13	..	.....	1	12	112	381					
16	Nt.	10	..	2	13	..	.....	3	27	82	301	362	1,440	2,820	4,146	
17	Hy.	10	..	2	13	..	.....	2	41	138	620	1,270	2,450	4,310	5,129	
6	Ht.	33	4	3	..	..	× 0.37	1	18	91	374	625	877	880		
8	Ga.	33	4	3	..	..	× 0.37	2	60	105	192	263	349			
1	Wi.	10	13	2	..	..	.....	1	5	11	20	39	68	47		60
4	St.	10	13	..	..	2	.....	8	15	19	34	58	52	135		
5	St.	10	13	2	..	..	.....	1	8	13	55	104	108			
7	Mc.	10	13	2	..	..	.....	1	5	11	24	31	68	77		57
12	Mc.	10	13	2	..	..	.....	1	6	10	14	30	39	79		
18	Nt.	10	13	2	..	..	.....	2	5	9	9	11	36	37		54
19	Hy.	10	13	2	..	..	.....	1	7	10	11	23	30	35		62

* Blood was stored at 5 C. in flasks with cotton plugs.

† Observed values were multiplied by the dilution factor for comparison with values in other mixtures.

5.4 per cent dextrose in water and three volumes of 3.2 per cent dihydric sodium citrate in water; ten volumes of blood, thirteen volumes of 0.95 per cent sodium chloride in water and two volumes of 3.2 per cent dihydric sodium citrate in water, and twenty-three volumes of blood and two volumes of 3.2 per cent dihydric sodium citrate in water. In each instance the storage temperature was 5 C. and no attempt was made to exclude the air. The hemoglobin of the plasma¹² obtained by centrifuging specimens after thorough mixing was estimated at five day intervals of storage. Since the values obtained with this procedure depend on the number of erythrocytes subjected to hemolysis and the dilution of the plasma, recalculation was necessary in some mixtures to make hemoglobin values directly comparable with those obtained in mixtures containing ten volumes of blood and fifteen volumes of preservative. The results of these experiments are included in table 1. The values obtained show that there was progressive hemolysis in all preservatives during storage. The rates

THE EFFECTS OF TEMPERATURE ON HEMOLYSIS

It is generally stated that blood kept at room temperature will hemolyze more rapidly than in the refrigerator, and our experiences confirm this observation. Blood was drawn from one individual into the dextrose-citrate mixture previously described, apportioned into small flasks in 50 cc. samples and stored at room temperature (20 C.) in a dark cupboard. The flasks were placed in a shallow pan containing water and covered with a bell jar to increase the relative humidity and thus reduce evaporation through the cotton plugs. Plasma hemoglobin was determined after each two day period of storage. The values for plasma hemoglobin in milligrams per hundred cubic centimeters of plasma were as follows: no days, 2 mg.; two days, 60 mg.; four days, 95 mg.; six days, 86 mg.; eight days, 115 mg.; ten days, 94 mg.; twelve days, 458 mg. When these results are compared with those in experiment 12 (table 1), in which the blood was stored for the same period in the same preservative, but at 5 C., it will be seen that the same amount of hemolysis occurred in two days at 20 C. as in thirty days at 5 C.

11. The apparent deviation from the original concentration of sodium citrate is due to the fact that Rous and Turner used the salt with 5½ molecules of water of crystallization.

12. The term "plasma" is used in this paper to denote the noncellular portion of the blood plus the preservative solutions which dilute it.

A far more important temperature effect was discovered when we attempted to apply the facts obtained in the laboratory to the routine operation of a blood bank in the University Hospitals. In collecting blood to be preserved for transfusions it was the early practice to draw 500 cc. from each donor directly into an Erlenmeyer flask containing the preservative to be used. When 500 cc. of blood was drawn into from 50 to 100 cc. of sodium citrate solution no marked hemolysis was encountered, but when a similar amount was added to 750 cc. of the dextrose-citrate mixture (650 cc. of 5.4 per cent dextrose in water plus 100 cc. of 3.2 per cent dihydric sodium citrate in water) the blood in about one half of the flasks hemolyzed after only a few hours in the refrigerator. About 10 liters of blood was lost in this manner before the explanation became apparent. The temperature of the room where the blood was drawn was approximately 20 C. The temperature of the preservative had been brought to that of the room before the withdrawal of the blood. After following many false leads it was found that, if a 20 cc. sample was taken from the 1,250 cc. of blood mixture immediately after mixing and placed in the refrigerator beside

days of storage. Obviously, it is important to observe the precautions we have outlined if the dextrose-citrate mixture is to be used successfully.

THE RESISTANCE OF PRESERVED ERYTHROCYTES TO TRAUMA

Rous and Turner⁴ demonstrated that there is no direct relationship between the resistance of red blood cells to trauma (such as shaking) and their ability to remain intact in hypotonic solutions. The erythrocytes of some species are normally more fragile than others under such conditions, although they may resist trauma very well. It seemed desirable to investigate further the effect of trauma on the preserved human erythrocytes, since this question has a direct bearing on the transportation of blood for military purposes and is indirectly concerned with the disintegration of transfused erythrocytes in the circulation.

An arbitrary shaking test was devised based on the method of Rous and Turner. About 16 cc. of blood mixture was divided into two equal parts, the control portion of 8 cc. being kept at the same temperature as the portion to be tested while the remaining 8 cc.

TABLE 2.—Percentage of Erythrocytes Hemolyzed by Shaking*

Experi- ment No.	Donor	Preservative, Volumes				Percentage of Erythrocytes Hemolyzed by Shaking							
		Blood	Dextrose	Sodium Chloride	Citrate	Days of Storage							
						0	5	10	15	20	25	30	35
14	Nt.	23	..	..	2	0.2	1.7	2.6	7.7	2.2	4.0	6.7	3.9
15	Hy.	23	..	..	2	...	0.4	2.0	5.1	5.8	6.9	5.3	...
16	Nt.	10	..	13	2	0.1	0.7	2.8	2.5	6.6	2.3	3.1	9.0
17	Hy.	10	..	13	2	...	0.1	1.6	3.0	8.7	11.6	8.3	...
18	Nt.	10	13	..	2	0.1	0.1	0.9	1.0	1.2	1.0	1.7	2.1
19	Hy.	10	13	..	2	...	0.1	0.2	0.2	0.1	0.2	0.3	...

* Arbitrary shaking test: 260 strokes per minute for thirty minutes.

the large flask, the blood in the small flask did not hemolyze while that in the large flask disintegrated within a few hours. Heating the preservative to body temperature before adding the blood did not prevent this initial hemolysis. Finally, the blood was drawn directly into the cold preservative which had just been taken from the refrigerator and the blood mixture was immediately returned to the cold room. This procedure effectively prevented initial hemolysis. This phenomenon has been encountered with citrated blood only when the room temperatures were extremely high (above 30 C.) and even then it has been prevented by drawing the blood into a flask placed in an ice bath. From the observations enumerated it seems logical to conclude that the almost immediate hemolysis observed in the earlier specimens was due to uneven cooling (from 37 to 5 C.) of various portions of a large volume of blood mixture which in some way destroyed many erythrocytes; when the blood was cooled rapidly and uniformly, this phenomenon did not occur. This would explain why hemolysis was rare in the presence of small quantities of citrate preservative but relatively frequent when larger volumes of blood mixture were employed without preliminary cooling. It should be emphasized that the phenomenon of hemolysis discussed in connection with the cooling of large quantities of blood occurs within a few minutes or a few hours after the blood is drawn and, so far as we can ascertain, has no relation to the slowly progressive hemolysis noted during many

was placed in a centrifuge tube of 15 cc. capacity, which was closed tightly with a rubber stopper. The tube was then clamped in a machine which shook the tube horizontally through its long axis at the rate of 260 complete strokes per minute for thirty minutes. At the end of the test both the shaken and the unshaken tubes were centrifuged simultaneously and the hemoglobin in the two samples of plasma was estimated.

between the plasma hemoglobin values in the two specimens was used to calculate the percentage of erythrocytes broken up by the shaking. This test was performed at five day intervals on stored blood from two donors in each of three preservatives. A summary of the results is given in table 2. While the values obtained and the method used leave much to be desired, the results show that there was a definite increase in fragility of red cells in all preservatives during the first ten days of storage. The erythrocytes stored in sodium chloride solutions were much more fragile than those stored in dextrose solutions. Whether this was due to some change in the cell membrane during storage in the saline solution or due to the protective action of the dextrose during shaking cannot be stated. Estimations of plasma viscosity and surface tension did not throw any light on the problem. The values obtained with citrated blood cannot be compared directly with those of the other two preservatives because each cubic centimeter contained 2.3 times as many erythrocytes, which in any standard shaking test

would increase the amount of trauma to which each cell was subjected. These observations would weigh heavily against the transportation of citrated blood for military purposes.

The data obtained from such violent shaking tests tend to show that the relatively slight trauma entailed in drawing the blood and mixing it with the preservative is probably not a significant factor in the development of hemolysis during storage.

THE EFFECT ON HEMOLYSIS OF THE EXCLUSION OF AIR DURING STORAGE

In the previous experiments blood mixtures were stored in flasks having the usual bacteriologic cotton plugs, which allowed free diffusion of atmospheric oxygen into the blood and of the blood carbon dioxide into the air. It seemed important to determine whether these changes had any appreciable effect on hemolysis during storage. Part of a blood preservative mixture was stored in the usual manner, while the other portion was poured into 50 cc. Erlenmeyer flasks, com-

rapidly than did blood exposed to the air or in an atmosphere of nitrogen.

Analyses of the content of oxygen, carbon dioxide and nitrogen conformed to the predictable values. The data will be published in another study.

PRACTICAL APPLICATIONS

Many of the facts demonstrated in the laboratory have been applied in the routine operation of the blood bank in the University Hospitals. The blood-dextrose-citrate mixture has proved practical and safe for human transfusions. Graduated Erlenmeyer flasks of 1,500 cc. capacity containing 650 cc. of 5.4 per cent anhydrous dextrose in water are autoclaved. Lots of 100 cc. of 3.2 per cent dihydric sodium citrate in water are autoclaved separately in flasks of 250 cc. capacity. These solutions are then stored in the refrigerator until required. Before the blood is collected, a two hole rubber stopper containing glass tubes is inserted in the mouth of the large flask, one tube being connected by rubber tubing to a glass adapter and a 16 gage needle

TABLE 3.—Effect of Exclusion of Air on Hemolysis*

Experiment No.	Donor	Preservative, Volumes			Atmosphere	Hemoglobin in Plasma, Mg. per 100 Cc.							
		Blood	Dextrose	Citrate		Days of Storage							
						0	5	10	15	20	25	30	35
12	Mc.	10	13	2	With air.....	1	6	10	14	30	39	79	..
					No air.....	1	3	5	6	7	10	16	..
7	Mc.	10	13	2	With air.....	1	5	11	24	31	83	71	87
					No air.....	1	..	..	6	..	..	17	..
20	Ko.	10	13	2	With air.....	1	..	..	49	..	..	..	..
					No air.....	1	..	..	32	..	..	..	..
22	Py.	10	13	2	With air.....	1	..	..	..	..	..	57	..
					No air.....	1	..	..	..	..	..	41	..
23	St.	10	13	2	With air.....	1	..	..	..	..	..	7	..
					No air.....	1	..	..	..	..	..	4	..
24	Py.	23	..	2	With air.....	3	..	..	..	..	..	3,040	..
					No air.....	3	..	..	..	..	..	1,512	..
25	St.	23	..	2	With air.....	2	..	..	..	..	..	3,318	..
					No air.....	2	..	..	..	..	..	1,632	..
21	Ko.	23	..	2	With air.....	2	..	..	1,430	..	..	..	..
					No air.....	2	..	..	640	..	..	..	..

* Blood stored at 5 C. in flasks with cotton stoppers or with air excluded.

pletely filling them. Rubber stoppers were then inserted so that the remaining air and some blood were displaced through glass capillaries in the stoppers, and the capillaries were sealed, aseptic precautions being employed. At each five day interval of storage a flask of the series was opened and the hemoglobin of the plasma estimated. The data are presented in table 3. It will be seen that in each experiment the blood stored with air excluded hemolyzed less rapidly than did the control blood exposed to the air, in the proportion of 1:1.5 up to 1:5. It should be noted, however, that this comparison was always made between fractions of the same blood mixed with the same lot of preservative; the hemoglobin values could not be duplicated in successive experiments, although the same relationship between two fractions of the same blood always held. This suggests either an individual difference between bloods or some slight variation in the preparation of the preservatives which has escaped detection.

The rates of hemolysis were studied in blood mixtures stored in Erlenmeyer flasks in which air of once or twice the volume of the mixture was trapped by closing the flasks tightly with rubber stoppers. Blood stored under these conditions hemolyzed no more

and the other to a suction bulb. After the citrate solution is aspirated through the needle into the dextrose solution and the two are thoroughly mixed, the needle is inserted into the donor's anesthetized vein and the blood is drawn into the mixture by suction, if necessary, the flask being rotated gently to mix the blood and the cold preservative (5 C.). The flask is immediately stored in the refrigerator until required for transfusion, when the blood is thoroughly mixed and passed through a fine wire mesh filter into an arsphenamine tube which is connected by rubber tubing to the needle in the recipient's vein. The blood is not warmed and is allowed to run in by gravity.

Criteria for determining when preserved blood becomes unfit for use cannot be presented accurately. From experience we have adopted the arbitrary rule that citrated blood should be discarded after ten days of storage and blood in the dextrose-citrate mixture is considered unfit for transfusion after thirty days. With this practice there have been no unusual reactions which could be ascribed to disintegrated blood and no hemoglobinuria. The oldest blood used was transfused after storage in dextrose-citrate mixture for thirty-eight days. The recipient suffered no reaction, and no hemoglobin appeared in the urine.

In the operation of a blood bank where the daily number of transfusions is large the need for a preservative in which blood can be stored for more than seven days is not urgent. If the number of transfusions is not large, however, a proportionately larger loss is incurred among bloods belonging to the rarer groups AB and B. In a blood bank which averages four transfusions daily the mathematical probability that a blood of group AB or B will be required within seven to ten days is not great. Therefore any preservative which can prolong the period of potential usefulness of such a blood results in smaller losses.

There is little occasion in civil practice to transport blood considerable distances. However, this is an important problem in modern military medicine. Three facts presented in this paper bear directly on the technic of transportation. In addition to the property of inhibiting hemolysis, the blood-dextrose-citrate mixture protected the erythrocytes from the trauma of shaking better than the other preservatives studied. The fact that flasks closed with rubber stoppers preserved blood as well as those with cotton plugs is a great advantage in designing facilities for transportation. Lastly, in addition to retarding hemolysis, the storage of blood in flasks from which all air is displaced reduces to a minimum the possible trauma by shaking.

CONCLUSIONS

1. Progressive hemolysis occurs in human blood stored in any of the preservatives studied.
2. The rate of hemolysis is much greater when blood is stored at 20 C. than at 5 C.
3. The addition of large quantities of isotonic dextrose solution to blood slows considerably the rate of hemolysis as compared with that in blood stored with little or no added dextrose.
4. The Rous-Turner blood-dextrose-citrate mixture has been so modified that it can safely be given intravenously without discarding the plasma. This modification consists of ten volumes of blood, thirteen volumes of 5.4 per cent aqueous solution of anhydrous dextrose and two volumes of 3.2 per cent dihydric sodium citrate in water.
5. Blood stored in the modified blood-dextrose-citrate mixture will hemolyze only one twenty-fifth to one fiftieth as much in thirty days at 5 C. as will blood in sodium citrate alone or in sodium citrate plus sodium chloride.
6. The blood-dextrose-citrate mixture has proved safe and practical for human transfusions and is of distinct advantage in the operation of blood banks with a small volume of transfusions.
7. Hemolysis is less in blood stored in sealed flasks from which the air is completely displaced by the blood mixture than when the blood is exposed to the air.
8. Blood stored in flasks containing air trapped by rubber stoppers hemolyzes no faster than blood exposed to the air in cotton-plugged flasks.
9. Erythrocytes stored in the dextrose-citrate mixture resist destruction by shaking better than do those stored in sodium citrate alone or in citrate-saline mixtures.
10. The initial hemolysis encountered when blood is drawn into large volumes of preservatives can be prevented if the blood is cooled rapidly and uniformly by mixing it with preservatives which have been previously cooled to about 5 C.

STUDIES ON PRESERVED HUMAN BLOOD

II. DIFFUSION OF POTASSIUM FROM THE ERYTHROCYTES DURING STORAGE

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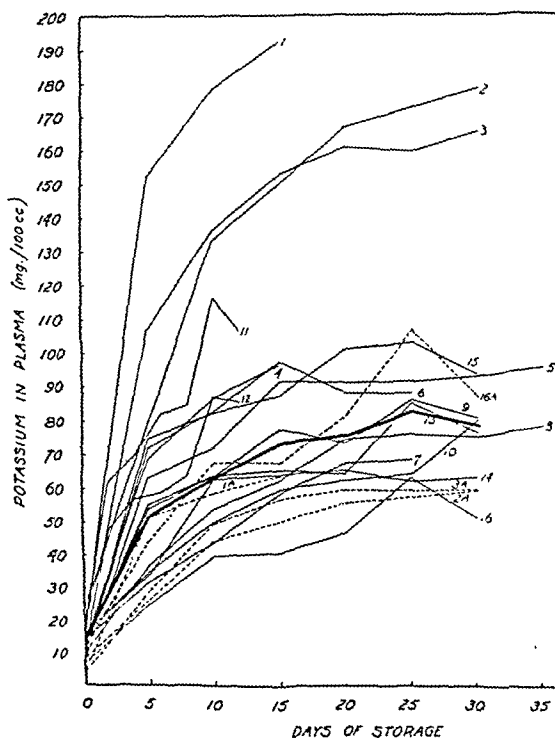
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The concentration of potassium in the human erythrocyte is normally from seventeen to twenty times that in the serum.¹ Any change in this ratio occurring during the storage of blood is of clinical interest in view of the well known toxicity of potassium salts injected intravenously. Dulière² noted a progressive increase



Plasma potassium values in various experiments in which blood was stored in several types of preservatives. The observed values are connected with thin solid lines. In all except experiments 1, 2 and 3 the blood was diluted by preservative mixtures approximately in the proportion of ten volumes of blood to fifteen volumes of preservative. In the three instances the plasma mixture was more concentrated, and when recalculation is made for comparison the values are connected with the broken lines. The heavy solid line represents the mean of all the comparable values.

in the plasma potassium of human blood stored for ten days. Jeanneney and his co-workers³ confirmed this observation and also demonstrated a coincidental diminution of plasma sodium.

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1. Peters, J. P., and Van Slyke, D. D.: *Quantitative Clinical Chemistry*, Baltimore, Williams & Wilkins Company, 1932, vol. 1 (Interpretations), p. 753.

2. Dulière, W. L.: La teneur en potassium et l'âge d'un sérum, *Compt. rend. Soc. de biol.* **107**:261-264 (April 25) 1931; Données expérimentales sur la répartition du potassium dans le sang extravasé: Comparaison entre la concentration physiologique dans le plasma et la concentration dans le liquide céphalo-rachidien, *ibid.* **108**:416-418 (Sept 26) 1931.

3. Jeanneney, G., and Servantie, L.: Valeur du dosage de potassium comme test d'altération du sang conservé, *Compt. rend. Soc. de biol.* **129**:1189-1190 (July 13) 1938. Jeanneney, G.; Servantie, L., and Ringenbach, G.: Les modifications du rapport potassium/sodium du plasma dans le sang citraté conservé à la glacière, *ibid.* **130**:472-473 (Nov. 16) 1938.

The studies here recorded were undertaken with the hope that the increase in plasma potassium might serve as an index of corpuscular deterioration. Some of the data were published in a preliminary report ⁴ and later presented in an exhibit.⁵ Scudder, Drew, Corcoran and Bull⁶ have since published detailed experiments dealing with the same subject.

METHODS

Blood was drawn aseptically from the median basilic veins of healthy men into pyrex Erlenmeyer flasks of 1,000 cc. capacity containing the preservative solutions. After uniform suspensions had been attained by rotation, each blood mixture was apportioned equally into seven or eight 250 cc. Erlenmeyer flasks, which were stored under identical conditions. For each analysis a flask containing 50 cc. of blood mixture was withdrawn from storage, the contents were thoroughly shaken and

cent sodium citrate (Merck's reagent grade, $\text{Na}_2\text{C}_2\text{H}_3\text{O}_7 + 2\text{H}_2\text{O}$) in water, 0.95 per cent sodium chloride U. S. P. in water and heparin (Connaught Laboratories) in water. These concentrations were considered isotonic because their freezing points were identical with that of blood serum (-0.56°C).

The refrigerator was cooled with salt brine which maintained the temperature between 3 and 5 C. Continuous thermal records were kept. The thick layer of frost on the open refrigeration coils insured a high relative humidity, so that evaporation from the blood mixtures was negligible.

INHERENT ERRORS OF THE PROCEDURE

The values obtained from the specimens in any series may be compared directly because the samples were derived from the same original mixture of blood and preservative solution. In comparing values obtained

TABLE 1.—Potassium in Plasma During Storage Under Various Conditions

Experiment No.	Donor	Conditions of Storage		Dilution Factor*	Preservative, Volumes					Potassium in Plasma, Mg. per 100 Cc.							
		Tem- pera- ture, C.	Atmosphere		Blood	Citrate	Dex- trose	Sodium Chloride	Hepa- rin	Days of Storage							
										0	5	10	15	20	25	30	35
1	Wi.	5	Cotton plugs	× 0.33	23	2	..	..	..	5	51	59	64	..	..	..	..
2	Mc.	5	Air excluded	× 0.33	23	2	..	..	..	8	..	44	..	56	..	60	..
3	Ha.	5	Cotton plugs	× 0.37	33	3	4	..	..	4	39	50	57	60	60	60	..
4	Wi.	5	Cotton plugs	.....	10	2	..	13	..	12	69	87	97	..	..	..	..
5	Wi.	5	Cotton plugs	.....	10	2	13	..	..	8	63	72	92	92	92	94	97
6	Ha.	5	Cotton plugs	.....	10	2	13	..	..	9	72	83	98	89	89	..	..
7	St.	5	Cotton plugs	.....	10	2	13	..	..	14	32	44	59	68	69	..	..
8	Mc.	5	Cotton plugs	.....	10	2	13	..	..	10	37	54	63	75	77	76	79
9	Mc.	5	Cotton plugs	.....	10	2	13	..	..	13	54	64	78	74	87	81	..
10	St.	5	Cotton plugs	.....	10	..	13	..	2	16	35	50	60	63	65	81	..
13	Mc.	5	Air excluded	.....	10	2	13	..	..	13	55	64	66	65	96	77	..
14	Cl.	5	Air limited	.....	10	2	13	..	..	16	34	63	49	66	63	64	..
15	Cl.	5	Carbon dioxide	.....	10	2	13	..	..	10	75	83	88	102	104	94	..
16	Cl.	5	Nitrogen	× 1.7	5	2	13	..	..	12	42	68	68	82	108	83	..
Coefficient of variation, %										39.0	20.4	21.7	20.9	18.2	19.6	15.7	
										Days of Storage							
										0	2	4	6	8	10	12	
11	Cl.	20	Air excluded	.....	10	2	13	..	..	18	62	70	82	85	117	107	
12	Cl.	20	Cotton plugs	.....	10	2	13	..	..	18	48	57	59	64	87	86	

* Observed values multiplied by the dilution factor for comparison with others.

centrifuged, and the plasma ⁷ was pipetted off for analysis. This procedure insured a constant proportion of cells and plasma in all specimens of a series derived from any initial blood mixture.

Estimations of the plasma potassium were made by the silver cobaltinitrite method of Truszkowski and Zwemer.⁸ Analyses were made in triplicate and were compared with duplicate standards. The deviation from the mean in these determinations was generally less than 2 per cent. The possibility that ammonia contributed to the observed values was excluded by comparing plasma filtrate with ashed samples.

The solutions used were 5.4 per cent anhydrous dextrose U. S. P. (Merck & Co., Inc.) or anhydrous dextrose (Eastman Kodak Company) in water, 3.2 per

cent sodium citrate (Merck's reagent grade, $\text{Na}_2\text{C}_2\text{H}_3\text{O}_7 + 2\text{H}_2\text{O}$) in water, 0.95 per cent sodium chloride U. S. P. in water and heparin (Connaught Laboratories) in water. These concentrations were considered isotonic because their freezing points were identical with that of blood serum (-0.56°C).

The refrigerator was cooled with salt brine which maintained the temperature between 3 and 5 C. Continuous thermal records were kept. The thick layer of frost on the open refrigeration coils insured a high relative humidity, so that evaporation from the blood mixtures was negligible.

The values obtained from the specimens in any series may be compared directly because the samples were derived from the same original mixture of blood and preservative solution. In comparing values obtained

ANALYSIS OF DATA

The pertinent data are presented in table 1. Since the most common dilution used was ten volumes of blood to fifteen volumes of preservative the observed values in plasma of this mixture are given and the

$$9. \text{ Coefficient of variation} = \frac{\text{Standard deviation} \times 100}{\text{mean}}$$

$$\text{Standard deviation} = \sqrt{\frac{\text{Sum of squares of deviations from the mean}}{\text{number of values}}}$$

4. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Changes in Human Blood Preserved for Transfusion, Proc. Soc. Exper. Biol. & Med. 40: 126-128 (Jan.) 1939.

5. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Preservation of Blood for Transfusion, Scientific Exhibit at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 15-19, 1939.

6. Scudder, John; Drew, C. R.; Corcoran, D. R., and Bull, D. C.: Studies in Blood Preservation, J. A. M. A. 112: 2263-2271 (June 3) 1939.

7. For the sake of brevity the term "plasma" will be used to denote the noncellular portion of the blood plus the preservative solution with which it was diluted.

8. Truszkowski, Richard, and Zwemer, R. L.: Determination of Blood Potassium, Biochem. J. 31: 229-233 (Feb.) 1937.

values in other dilutions were recalculated with a dilution factor to make them directly comparable (experiments 1, 2, 3 and 16).

When the values for plasma potassium are plotted on the ordinate against time of storage on the abscissa (as in the chart) it is evident that under all conditions investigated the rate of diffusion of that ion from the cells was rapid during the first five days, then slowed, and the plasma potassium approached a maximum in about fifteen days.

THE CONTRIBUTION OF HEMOLYZED CELLS TO THE RISE IN PLASMA POTASSIUM

The hemoglobin of the plasma was estimated by the method of Wu,¹⁰ and the values obtained were utilized to determine the proportion of hemolyzed erythrocytes. The high values for plasma potassium could not be explained by the release of potassium from hemolyzed cells. One example will suffice. In experiment 3 hemolysis was much greater than in experiment 5, but the corrected values for plasma potassium show that diffusion of that ion proceeded to approximately the same extent in the two (table 2).

TABLE 2.—Rate of Potassium Diffusion Compared with Rate of Hemolysis

Days of Storage	Hemoglobin in Plasma, Mg. per 100 Cc.		Potassium in Plasma, Mg. per 100 Cc.	
	Experiment 3*	Experiment 5	Experiment 3*	Experiment 5
0	1	1	4	8
5	8	5	39	63
10	91	11	50	73
15	374	20	57	92
20	625	39	60	92
25	877	68	60	92
30	880	47	61	94
35	...	60	..	97

* Observed values multiplied by the dilution factor of 0.37 to be directly compared with values in experiment 5.

EFFECT OF SODIUM, CHLORIDE, DEXTROSE, CITRATE AND HEPARIN ON POTASSIUM DIFFUSION

The addition of various amounts of sodium, chloride, dextrose, citrate or heparin did not affect the rate of diffusion of potassium from the cells, although some of these substances influenced the rates of hemolysis to a marked degree.¹¹

EFFECT OF ALTERATION OF THE CARBON DIOXIDE TENSION ON POTASSIUM DIFFUSION

Most of the experiments were performed with blood specimens exposed to the outside air through bacteriologic cotton plugs in the flasks, allowing free diffusion of carbon dioxide from the blood and oxygen into the blood. A few studies were made in which different gas tensions were established. In experiments 2, 11 and 13 the blood mixtures were stored with all air excluded. Erlenmeyer flasks of 50 cc. capacity were filled with blood mixtures, and the remaining air was displaced through capillary glass tubes in rubber stoppers. The tubes were then sealed in the flame. This procedure kept the oxygen and carbon dioxide tensions at approximately the original values; thus the carbon dioxide was much greater and the oxygen much less than in blood mixtures exposed to the air. The diffu-

sion of potassium from the cells was not significantly altered by these conditions.

Storage under different atmospheres was also utilized. The blood mixture in experiment 14 was stored with an equal volume of air trapped by a rubber stopper. In experiment 15 the air was displaced by carbon dioxide, in experiment 16 by nitrogen. These conditions did not affect the potassium diffusion.

THE EFFECT OF TEMPERATURE ON POTASSIUM DIFFUSION

In experiments 11 and 12 blood mixtures were stored at room temperature (approximately 20 C.). In one series of flasks air was entirely excluded, while the flasks of the other series were closed with cotton plugs and placed in a pan of water covered by a bell jar to control evaporation. Hemolysis proceeded very rapidly at this temperature¹¹ but the potassium diffusion was not noticeably accelerated.

COMMENT

The data presented agree in general with those reported by Scudder and his associates.⁶ Certain apparent discrepancies may be explained by differences in experimental procedure. The workers just cited stored large amounts of blood mixture in one flask and pipetted off samples of supernatant fluid for analysis. Their method assumes a uniform distribution of potassium throughout the plasma overlying the layer of cells, while the sampling depletes the plasma and makes recalculation necessary to accommodate for changes in dilutions. In the method reported here, all specimens for an experiment were derived from the original blood mixture, stored individually and analyses made on plasma from which the corpuscles had been centrifuged. Thus all samples of a series originally had the same proportion of cells to plasma.

CONCLUSIONS

1. There is progressive diffusion of potassium from human erythrocytes into the plasma during storage.
2. This diffusion is rapid during the first five days but becomes gradually less. A maximum concentration of potassium in the plasma is approached in from fifteen to twenty days.
3. The high values of plasma potassium attained in from fifteen to thirty days of storage cannot be accounted for by the release of that ion from completely hemolyzed cells.
4. Variations in the content of sodium, chloride, citrate and dextrose in the preservative mixtures or storage at different temperatures and in various atmospheres did not affect the diffusion rate.

The Neuroses in Aviation.—Nervous fatigue such as occurs in aviation does not involve functional disorders or disturbances and is readily amenable to rest. There is a point, however, where functional nervous disturbances may make their appearance and an actual neurosis intervene. There are two general types of neuroses which develop in airplane pilots. One type develops in relatively stable individuals, is not necessarily disabling and is an entity seen only among aviators. The other type develops in relatively unstable pilots or in relatively stable pilots under conditions of unusual stress, is disabling, and is identical with those neuroses seen in general practice. The former is known as aeroneurosis, while the latter is composed of the ordinary clinical neuroses which have flying as the principal inciting cause.—Armstrong, Harry G.: Principles and Practice of Aviation Medicine, Baltimore, Williams & Wilkins Company, 1939.

10. Wu, Hsien: Studies on Hemoglobin: III. An Ultra-Micro-Method for the Determination of Hemoglobin as a Peroxidase, *J. Biochemistry* 22: 189-194 (Jan.) 1923.

11. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood: I. Various Factors Influencing Hemolysis, this issue, p. 850.

STUDIES ON PRESERVED HUMAN BLOOD

III. TOXICITY OF BLOOD WITH HIGH PLASMA POTASSIUM TRANSFUSED INTO HUMAN BEINGS

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In a previous paper¹ it was shown that some of the potassium in the erythrocytes of human blood diffused out during storage and that the maximum concentration of that ion in the plasma was approached in fifteen days. The rate or the amount of diffusion was not affected by the type of preservative used or the other conditions of storage studied. The question arose as to whether blood stored for two weeks or more would be toxic when transfused into human beings. Some clinical evidence existed indicating that such blood was not harmful, since various workers had occasionally trans-

When Zwemer and Truszkowski⁴ attempted to determine the lethal dose of potassium salts in various animals, intraperitoneal injection was finally adopted, so difficult was it to control the blood level by intravenous administration because of the rapidity of diffusion of the salts into the tissues. To illustrate this fact, one experiment in our laboratory may be cited. Two dogs were selected, each weighing 9.5 Kg. One animal was given an injection of 0.3 Gm. of potassium chloride in the jugular vein. The operation was completed in thirty seconds and the dog died within two minutes from cardiac arrest. The other dog received exactly the same dose of the salt in the same manner except that the time taken for injection was sixty seconds. No abnormal signs resulted, and the animal remained perfectly well. It is therefore evident that in considering the toxicity of potassium from intravenous administration the velocity of injection is an important factor. When a patient receives a transfusion in one median basilic vein it seems that the electrocardiogram would present more direct evidence of potassium toxicity than would estimations of the serum potassium of blood drawn from the other median basilic vein.

Experimental Data

Experimental Data													
Transfused Blood									Observations on Recipient				
Recipient Number	Days of Storage	Volume of Blood Mixture, Cc.	Blood Mixture, Volumes			Plasma Potassium,* Mg. per 100 Cc.	Total Plasma Potassium, Mg.	Velocity of Injection, Cc. per Min.	Serum Potassium,* Mg. per 100 Cc.			Clinical Symptoms	Electrocardiographic Changes
			Blood	Dextrose	Citrate				Before Transfusion	Middle of Transfusion	End of Transfusion		
1	9	375	10	13	2	....	...	8.3	....	....	....	Urticaria	Tachycardia due to pruritus
2	9	600	23	..	2	....	...	10.8	....	....	....	None	No change
3	7	600	23	..	2	77.0	268	17.0	....	....	....	None	No change
4	17	1,250	10	13	2	52.0	533	15.8	24.7	24.8	25.4	None	No change
5	17	1,250	10	13	2	48.2	494	12.8	....	....	....	None	No change
6	23	1,250	10	13	2	60.8	623	27.0	....	....	....	None	No change
7	15	1,250	10	13	2	56.7	550	16.8	....	....	....	None	No change
8	23	1,250	10	13	2	51.0	522	19.2	17.4	16.9	16.6	None	No change
9	18	1,250	10	13	2	37.6	385	27.0	17.3	17.6	17.2	None	No change
10	18	1,250	10	13	2	54.1	554	14.7	18.0	18.3	17.1	None	No change
11	20	1,250	10	13	2	58.2	596	22.7	17.2	16.8	19.2	None	No change
12	24	1,200	10	13	2	78.6	786	43.3	17.1	17.5	18.7	None	No change
13	10	600	23	..	2	138.0	517	6.6	23.4	24.1	25.6	None	No change
14	10	500	23	..	2	148.0	473	41.6	15.5	16.7	17.2	None	No change

* Potassium values were obtained by the silver cobaltinitrite method. All determinations were checked by the Consolazio and Talbot chloro-platinate method.

fused aged blood successfully before the phenomenon of potassium diffusion was known.

The subject of the toxicity of potassium salts administered intravenously has been reviewed by Scudder, Drew, Corcoran and Bull,² and the reader is referred to their paper for the bibliography. It is undoubtedly true that, if the concentration of potassium in the blood plasma reaching the heart is increased sufficiently, changes occur in the conducting mechanism, which may cause cardiac standstill. Winkler, Hoff and Smith³ demonstrated that isotonic solutions of potassium chloride injected into the femoral veins of dogs cause alterations in the electrocardiogram when the serum potassium attains a concentration of from 5 to 11 millimols per liter and that cardiac arrest results when the level reaches from 14 to 16 millimols.

From the Departments of Internal Medicine and Obstetrics and Gynecology, State University of Iowa College of Medicine.
1. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood: II. Diffusion of Potassium from the Erythrocytes During Storage, this issue, p. 855.
2. Scudder, John; Drew, C. R.; Corcoran, D. R., and Bull, D. C.: Studies in Blood Preservation, J. A. M. A. 112: 2263-2271 (June 3) 1939.
3. Winkler, A. W.; Hoff, H. E., and Smith, P. K.: Electrocardiographic Changes and Concentration of Potassium in Serum Following Intravenous Injection of Potassium Chloride, Am. J. Physiol. 124: 478-483 (Nov.) 1938.

The object of this study was to ascertain whether preserved blood stored long enough to attain maximum concentration of potassium in the plasma was toxic when transfused into human beings under the usual clinical conditions. From data presented in another study¹ it was evident that blood must be used which had been stored fifteen days or longer to attain the maximum concentration of plasma potassium. It had also been shown⁵ that a practical method of preserving blood for that length of time without extensive hemolysis was the use of a mixture of ten volumes of blood, thirteen volumes of 5.4 per cent dextrose in water and two volumes of 3.2 per cent dihydric sodium citrate in water. This dilution of the plasma reduced the concentration of the potassium per cubic centimeter by about two-thirds the value obtaining in citrated blood of the same age, but the total amount of the ion in the plasma was approximately the same in the two mixtures since it was derived from the erythrocytes of 500 cc. of blood in both cases. Transfusion of citrated blood stored for fifteen days was considered too dangerous:

4. Zwemer, R. L., and Truszkowski, Richard: The Importance of the Cortico-Adrenal Regulation on Potassium Metabolism, Endocrinology 31: 40-49 (Jan.) 1937.
5. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood: I. Various Factors Influencing Hemolysis, this issue, p. 850.

because of the high content of hemoglobin in the plasma, but such mixtures stored for ten days were used in some cases since the concentration of potassium per cubic centimeter of plasma was higher than in the more dilute dextrose-citrate mixture.

Fourteen patients requiring transfusions were given preserved blood by the usual technic of intravenous administration. In none was there clinical or electrocardiographic evidence of heart disease. Precautions were taken to insure the urine being alkaline before transfusion by the administration of sodium bicarbonate if necessary.⁶ The blood mixture was allowed to run into the vein of the recipient by gravity. The velocity was varied by adjusting the height of the column of fluid and by using needles of two calibers, 16 gage and 20 gage. The preserved blood was not heated to body temperature before injection.

Immediately before, in the middle and at the conclusion of each transfusion blood specimens were withdrawn from the opposite arm of the recipient. A sample was also taken from the last 20 cc. of transfusion mixture remaining in the apparatus. Quantitative estimations of plasma or serum potassium were made in duplicate on each sample, using both a modification of the silver cobaltinitrite method of Truszkowski and Zwemer,⁷ to be reported later by one of us (Harris), and also the chloroplatinate method of Consolazio and Talbott with slight modification.⁸ The values obtained by the two procedures gave satisfactory checks, so that only the results by the silver cobaltinitrite method are published here.

When the blood samples were withdrawn from the recipient, electrocardiographic tracings were made with the three standard leads. All the pertinent data are presented in the table. No unusual clinical reactions were observed except for the appearance of generalized urticaria in case 1. Electrocardiograms during this transfusion showed tachycardia, which was attributed to the necessary scratching due to the pruritus. In a large series of transfusions of preserved blood no evidence has been obtained to attribute the occasional incidence of urticaria to the high potassium content of the plasma. There were no alterations of the electrocardiograms of the other thirteen recipients during transfusion. The velocity of injection in different experiments varied from 6.6 to 43.3 cc. of blood mixture per minute. Two of the recipients (cases 4 and 13) had slightly elevated initial serum potassium values and one (case 14) had a low level before transfusion. The highest concentration of plasma potassium in transfused blood was 148 mg. per hundred cubic centimeters, and this was given at the rate of 41.6 cc. of blood mixture per minute. The rise in serum potassium of the recipients during transfusion never exceeded 2.2 mg. per hundred cubic centimeters and was not accompanied by any symptoms.

CONCLUSIONS

The high plasma potassium content in blood preserved for thirty days is not toxic when the blood mixture is transfused into human beings at velocities of less than 43.3 cc. per minute. The concentrations of plasma potassium encountered in blood stored for one month are not high enough to cause significant increases in the serum potassium of the recipient.

STUDIES ON PRESERVED HUMAN BLOOD

IV. TRANSFUSION OF COLD BLOOD INTO MAN

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It is still common clinical practice to maintain at body temperature fluids which are being administered intravenously. This probably originated from clinical dicta which preceded the fundamental work of Seibert¹ on pyrogenic substances. Seibert demonstrated that certain river bacteria could live in distilled water and produce soluble substances called pyrogens, which were ultrafiltrable and were relatively thermostable. When these substances were injected intravenously into rabbits, febrile reactions ensued. This work has been amply confirmed both experimentally and clinically. Subsequent observations when the presence of pyrogens has been carefully excluded have disproved the theory that the temperature of the fluids is responsible for the production of chills and fever.

Rademaker² reported that intravenous administration to patients of fluids at 20 C. (68 F.) and at 43.3 C. (110 F.) caused no reactions. When cold solutions were given there was a slight drop in the body temperature without chills. Thompson³ stated that injections given at 20 C. (68 F.) and 42 C. (107.6 F.) produced no chills or fever in patients but that cold fluids usually lowered the blood pressure slightly. In an extensive study on rabbits, Banks⁴ not only confirmed the work of Seibert but concluded that solutions administered parenterally at from 68 to 113 F. (20 to 45 C.) had no influence on the body temperature.

A rough calculation can be made showing the effect which the intravenous injection of a cold solution would have on the body temperature if the heat regulatory mechanisms were suspended, and the assumption is made that the thermal capacity of the parenteral fluid is the same as that of the body tissues. A simplified formula expressing the physical principle of equal heat exchanges can then be stated: $M_1(t_1 - t) = M_2(t - t_2)$ where M_1 is the mass of parenteral fluid injected, M_2 the body weight, t_1 the temperature of the fluid, t_2 the original body temperature, and t the resultant temperature of the transfused body. If one takes a specific clinical problem, when 600 cc. of fluid at 5 C. (41 F.) is injected intravenously into a man weighing 70 Kg. and having a temperature of 37 C. (98.6 F.) the following equation results: $0.6(5 - t) = 70(t - 37)$, or $t = 36.72$ C. The body temperature would then be reduced by only 0.28 C.

This conception is of practical clinical importance because considerable labor is expended by the intern and nursing staff and frequently costly apparatus is used in an effort to maintain parenteral fluids at body temperature during injection. When the parenteral

From the Department of Internal Medicine, State University of Iowa College of Medicine.

1. Seibert, F. B.: Fever-Producing Substance Found in Some Distilled Waters, *Am. J. Physiol.* **67**: 90-104 (Dec.) 1923; The Cause of Many Febrile Reactions Following Intravenous Injections, *ibid.* **71**: 621-651 (Feb.) 1925.

2. Rademaker, Lee: The Cause and Elimination of Reactions After Intravenous Infusions, *Ann. Surg.* **92**: 195-201 (Aug.) 1930.

3. Thompson, S. A.: Preparation of Dextrose and Saline Solutions and Apparatus for Intravenous and Subcutaneous Use, *Am. J. Surg.* **22**: 127-134 (Oct.) 1933.

4. Banks, H. M.: A Study of Hyperpyrexia Reaction Following Intravenous Therapy, *Am. J. Clin. Path.* **4**: 269-291 (May) 1934.

6. DeGowin, E. L.; Warner, E. B., and Randall, W. L.: Renal Insufficiency from Blood Transfusion: II. Anatomic Changes in Man Compared with Those in Dogs with Experimental Hemoglobinuria, *Arch. Int. Med.* **61**: 609-630 (April) 1938.

7. Truszkowski, Richard, and Zwemer, R. L.: Determination of Blood Potassium, *Biochem. J.* **31**: 229-233 (Feb.) 1937.

8. Consolazio, W. V., and Talbott, J. H.: Modification of the Method of Shohl and Bennett for the Determination of Potassium in the Serum and Urine, *J. Biol. Chem.* **126**: 55-61 (Nov.) 1938.

fluid is blood, there is the danger of hemolysis from the injudicious application of heat. Baker⁵ reported a case in which blood inadvertently heated to 130 F. (54.4 C.) produced transfusion anuria. He also pointed out the lack of necessity of heating transfused blood and stated that transfusions were given at room temperature at the Manchester Royal Infirmary with impunity.

The problems introduced by the use of preserved blood for transfusions make imperative a study of the effects of injecting fluids at room temperature or lower. The blood mixtures are usually stored in large flasks in volumes of 500 to 1,000 cc. at 5 C. When the blood mixture is required for transfusion, time may be consumed in warming such a quantity to body temperature or even to room temperature. Moreover, evidence has been presented in another paper⁶ to show that procedures which vary the temperature of different parts of a blood mixture tend to promote hemolysis.

Because of these considerations, a study of the effects of transfusion of unheated blood was made. This study was divided into two parts: first, detailed observations

were made of the recipient's rectal temperature and blood pressure. The data are summarized in table 1.

In conducting this series of experiments the attempt was made to simulate the usual conditions under which this particular apparatus is used and also to produce the extreme variations to which the procedure might be subjected clinically. Thus the minimum temperature of the transfused blood at the recipient's vein ranged in different transfusions from 25 to 15 C. and the velocity of transfusion varied from 6.0 to 42.8 cc. per minute. No clinical symptoms or signs were noted in any of the ten recipients. The rectal temperatures either remained constant or declined a maximum of 0.2 degree C. Patient 7 had fever (initial temperature 101.2 F.), which was not affected by the transfusion. The blood pressure readings varied slightly during the transfusion, but most of the readings were within the limits of error of the method. In case 1 the systolic pressure rose 25 mm. of mercury and the diastolic pressure increased by 10 mm., but the patient was obviously apprehensive. In case 6 the systolic pressure fell 30 mm. and the

TABLE 1.—Experimental Data

Recipient			Transfused Blood				Effects on Recipient		
Recipient Number	Body Weight, Kg.	Initial Rectal Temperature, O.	Room Temperature, C.	Total Volume, Cc.	Velocity of Injection, Cc. per Min.	Minimum Temperature of Blood Mixture at the Vein of the Recipient, C.	Fluctuation of Rectal Temperature, C.	Fluctuation of Blood Pressure, Mm. of Mercury*	Clinical Symptoms
1	68.1	37.5	....	600	6.0	23.0	0	+25/10	Excited
2	73.1	37.6	....	600	8.0	25.0	-0.1	.....	No symptoms
3	73.1	37.4	....	600	6.6	24.0	0	.....	No symptoms
4	45.0	38.1	29.5	600	30.0	19.0	-0.2	+5/10	No symptoms
5	70.9	38.0	29.5	600	20.0	18.5	-0.1	0	No symptoms
6	65.9	37.6	24.0	600	20.0	16.0	-0.1	-30/10	No symptoms
7	77.2	38.4	23.0	600	42.8	18.5	0	+0/5	No symptoms
8	68.1	38.2	28.0	600	30.0	19.0	0	+10/15	No symptoms
9	56.3	37.2	28.0	1,250	22.7	17.0	-0.1	0	No symptoms
10	50.0	37.4	32.0	1,200	40.0	15.0	0	+5/5	No symptoms

* The first value denotes variation in systolic pressure, the second, diastolic.

on ten patients receiving transfusions, and, second, a careful check of all patients receiving transfusions of cold preserved blood in the University Hospitals for a period of eleven months.

Ten patients receiving transfusions were carefully studied. A flask of preserved blood was taken from the refrigerator at 5 C. and within a few minutes was being administered to the recipient. The apparatus used for injection consisted of an arsphenamine tube of 800 cc. capacity communicating with the recipient's vein by about 4 feet of gum rubber tubing, a glass adapter and a needle. The velocity of injection was controlled by varying the height of the column of fluid and the use of either 20 gage or 16 gage needles. The temperature of the transfused blood was observed by inserting a thermometer into the rubber tubing adjacent to the point where the blood mixture ran into the needle in the recipient's vein. The blood mixture was poured into the arsphenamine tube at approximately 5 C., but as it ran through the rubber tubing it approached the temperature of the room. The temperature of the blood at the recipient's vein was thus lower near the beginning of the transfusion and also varied with the velocity of injection. During the transfusion frequent observa-

diastolic pressure 10 mm. This could be accounted for by assuming some initial emotional elevation.

All the patients in the series either volunteered the information, or affirmed when asked, that the vein into which the blood was running felt cool or cold but that this symptom was not such as to cause annoyance. When the blood was injected into the median basilic vein, palpation of the corresponding cephalic vein often gave a sensation of cold to the examiner.

The second part of the study consisted of the application of this method of transfusion of cold preserved blood for routine hospital purposes. In the University Hospitals from Feb. 14 to Aug. 3, 1939, a total of 568 transfusions of cold blood were given by means of the general procedure outlined. The transfusions were administered by many persons and at different velocities with room temperatures varying widely. The blood was usually injected through a 20 gage needle, although smaller needles were used for children. Each recipient was examined within twenty-four hours after the transfusion by an intern attached to the Blood Transfusion Laboratory, who himself tested the urine for the presence of hemoglobin, noted any unusual symptoms during or after transfusion and recorded any elevation of temperature.

The results of these observations are shown in table 2.

Whether any of the reactions reported could be ascribed to the temperature at which the blood was

5. Baker, S. L.: Urinary Suppression Following Blood Transfusion, *Lancet* 1: 1390-1394 (June 12) 1937.

6. DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood. I. Various Factors Influencing Hemolysis, this issue, p. 850.

transfused can be answered only by indirect evidence. The incidence of 8.5 per cent reactions of all varieties seems too small to ascribe to a procedure used in all cases. The hemoglobinuria was adequately explained by other causes in both cases; one patient received incompatible blood and the other was given blood which had a high concentration of plasma hemoglobin. No correlation between the procedure and the occurrence of urticaria could be found.

The presence of pyrogens in the parenteral fluids mixed with the transfused blood and in the apparatus should be considered. All the equipment utilized in the administration of blood and parenteral fluids was prepared in a central laboratory. The fluids for intravenous use were manufactured in the same place, one source of distilled water being used for parenteral fluids, for cleansing apparatus and for blood preservatives. All of

TABLE 2.—Results of Transfusions from Feb. 14 to Aug. 3, 1939

Symptoms	Number	Percentage
No symptoms or signs.....	520	91.5
Chills only.....	6	1.0
Chills and fever.....	31	5.4
Urticaria only.....	8	1.4
Hemoglobinuria.....	2	0.3
Abdominal pain.....	1	0.1
Total.....	568	99.7

these functions were under the same general supervision so that if pyrogens were present in the transfused blood it was to be expected that they would also occur in the parenteral solutions in about the same proportion. This was apparently a fact, although the only data available cover the month of July 1939.

During that period 1,076 intravenous infusions were given at room temperature and in thirty-two cases (2.9 per cent) there were associated chills and fever. For the same time the statistics for transfusions of preserved blood given cold were as shown in table 3.

TABLE 3.—Results of Transfusions During July 1939

Symptoms	Number	Percentage
No reaction.....	103	91.9
Chills and fever.....	7	6.2
Hemoglobinuria.....	1	0.8
Urticaria.....	1	0.8
Total.....	112	99.7

The source of the febrile reactions in both parenteral infusions and blood transfusions is still not explained, but the incidence in either case is so low that it cannot be attributed to the temperature of the fluid administered.

CONCLUSIONS

1. A detailed study of ten patients who were given transfusions of blood mixtures varying from 25 to 15 C. and at velocities from 6.0 to 42.8 cc. per minute revealed no significant lowering in the body temperature, no consistent changes in blood pressure and no untoward clinical symptoms.

2. Preserved blood has been administered without preheating in 568 cases with no reactions which could be attributed to the procedure.

3. The practice of transfusing preserved blood cold is a great convenience in conserving time and prevents untoward reactions involved in the process of heating it.

4. Parenteral fluids other than blood can be administered at room temperature with safety.

STUDIES ON OXYURIASIS

XXII. THE EFFICACY OF GENTIAN VIOLET IN THE TREATMENT OF PINWORM INFESTATION

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The inadequacy of available therapeutic measures for the control of pinworm (*Enterobius vermicularis*) infestation is well known to those physicians who have had experience in dealing with this troublesome problem. In fact, the failure of conventional methods of therapy in these cases is sometimes a source of embarrassment to the physician, particularly when these patients return time after time for further treatment. Unfortunately, either the large majority of the published articles on the treatment of this disease have been based on inadequate numbers of cases or reliance has been placed on the patient's history for the diagnosis and on clinical observations for the efficacy of the treatment.

Undoubtedly the pinworm is the most common and widespread of the animal parasites infesting man in this country. Improvements in sanitation and an efficient meat inspection service have limited the spread of many animal parasites, but modern sanitation has apparently had little effect in limiting the spread of the pinworm. Cram, Jones, Reardon and Nolan¹ have reported an incidence of pinworms of 35.4 per cent in 628 persons from the general population of Washington, D. C. While these cases did not represent a random sampling of the population and the incidence figure in this group is probably higher than is the general incidence figure, yet the latter figure is probably an impressive one.

Prior to the development of the NIH anal swab described by Hall,² there was no efficient method available for the diagnosis of pinworm infestation. Ordinary methods of stool examination, such as are used for the detection of other intestinal parasites, are not of value in the case of the pinworm for the reason that the ova of the parasite are not deposited in the intestinal tract of the host but are expelled by the gravid female worm after its migration out of the anal canal. In this connection, Wright and Cram³ found that only fourteen of 102 known pinworm infestations were detected on stool examination, while Sawitz, Odom and Lincicome⁴ detected 14 and 18 per cent of 131 positive cases by brine and zinc sulfate flotations, respectively, whereas 72 per cent of these positive cases were detected by one NIH swab examination and 99 per cent by seven NIH swab examinations.

The NIH swab consists of a glass rod tipped with a small square of cellophane. This rod is enclosed in

1. Cram, Eloise B.; Jones, Myrna F.; Reardon, Lucy, and Nolan, Mabelle O.: Studies on Oxyuriasis: VI. The Incidence of Oxyuriasis in 1,272 Persons in Washington, D. C., with Notes on Diagnosis, Pub. Health Rep. 52: 1480-1504 (Oct. 22) 1937.

2. Hall, Maurice C.: Studies on Oxyuriasis: I. Types of Anal Swabs and Scrapers, with a Description of an Improved Type of Swab, Am. J. Trop. Med. 17: 445-453 (May) 1937.

3. Wright, Willard H., and Cram, Eloise B.: Studies on Oxyuriasis: IV. Some Aspects of the Problem of Therapy, Am. J. Dis. Child. 54: 1276-1284 (Dec.) 1937.

4. Sawitz, Willi; Odom, Vada L., and Lincicome, David R.: The Diagnosis of Oxyuriasis: Comparative Efficiency of the NIH Swab Examination and Stool Examination by Brine and Zinc Sulfate Flotation for *Enterobius Vermicularis* Infection, Pub. Health Rep. 54: 1148-1158 (June 30) 1939.

a glass test tube for convenience and for the prevention of infection in handling. In use, the cellophane tip is stroked over the perianal region and pinworm eggs, if present, will usually adhere to the cellophane which may be removed, mounted between a glass slide and coverslip and examined for ova. This method of diagnosis is superior to any other practical method of examination and has been used by us for making diagnoses and for checking the efficacy of treatment.

Another important fact disclosed by investigations in our laboratory has been that relating to the frequent occurrence of familial pinworm infestations. Wright and Cram³ have pointed out the necessity from a control standpoint of treating pinworm infestation on a familial basis on the ground that it is useless to treat individuals in a family or household in which other individuals, infested with pinworms, are left untreated. The abundant opportunities for reinfestation in such households are indicated by the results of Reardon⁵ of egg counts in twenty gravid female pinworms in which the mean of the counts was 11,105 and by the experience of Nolan and Reardon,⁶ who were able to recover pinworm ova from objects at all levels in all rooms in infested households thus indicating the possibilities of airborne infections. In view of the practical impossibility of applying hygienic measures in a manner sufficiently rigorous to control pinworm infestations, the use of chemotherapy would appear to be necessary in most cases for the successful attack on this parasite.

EFFICACY OF OTHER METHODS OF THERAPY

In experiments in this laboratory, single-dose treatments with tetrachlorethylene or hexylresorcinol orally have not proved satisfactory. While tetrachlorethylene is probably the most effective of the available single-dose treatments, as shown by Wright, Bozicevich and Gordon,⁷ it is not sufficiently effective to be of value in the treatment of familial pinworm infestations. Under certain conditions of temperature and moisture, pinworm eggs may remain viable in the laboratory for two weeks or longer. If the ova are equally resistant under household conditions, patients freed of pinworms by a single-dose treatment may be subjected to frequent reinfestation over this period of time.

These facts led Wright, Brady and Bozicevich⁸ to a search of some method of treatment which could be administered over a period of time sufficient to allow for desiccation of the pinworm ova in the patient's surroundings, with a view of eliminating the possibilities of reinfestation. Santonin, one of the few known anthelmintics which can be given with safety in repeated treatments, was not found sufficiently valuable to warrant its use in this connection. Only eleven, or 55 per cent, of twenty cases treated with santonin over a period of ten days were negative on post-treatment swab examinations. As an inadequate number of post-treatment swabs was obtained in some of these cases, it is probable that the efficacy of the treatment was actually at the rate of less than 50 per cent. Hexylresorcinol enemas, first used by Brown,⁹ have proved

relatively effective when compared with many other methods of treatment. Of twenty-seven cases in which such enemas were used, eighteen, or 66½ per cent, were negative on post-treatment swab examinations. The chief objections to the use of hexylresorcinol enemas are those concerned with the high cost of the drug and the labor in administering the treatment to several individuals in the family at the same time. For these reasons this treatment is not adapted for general use in familial infestations. The routine treatment with hexylresorcinol orally and by enema, as recommended by Craig and Faust,¹⁰ has been used in a few cases but not one of the individuals was freed from pinworms by this method of therapy.

Experience with the experimental use of the aforementioned methods of therapy led us to the view that a satisfactory treatment for pinworm infestation should fulfil certain specifications, as follows: 1. The drug should be sufficiently safe that it can be administered in repeated treatments over a period of time. 2. It should be highly effective. 3. It should be of reasonable cost. 4. It should be of such a nature that it can be easily administered and used with a minimum of effort in large families in which many persons are infested.

As none of the traditional methods of therapy which we had tested entirely fulfilled these specifications, we have carried out tests with gentian violet, one of the few known anthelmintics which can be given with safety in repeated treatments over a period of time.

PREVIOUS USE OF GENTIAN VIOLET

Our application of gentian violet in the treatment of oxyuriasis followed the employment of the drug in a number of other conditions. Young and Hill,¹¹ who were apparently the first to use the dye medicinally, employed doses of from 5 to 7 mg. per kilogram of body weight administered intravenously for the treatment of septicemia and local infections. Later, Faust and Yao¹² employed gentian violet orally and intravenously in the treatment of *Clonorchis sinensis* infestations. However, the drug has been used more extensively for *Strongyloides stercoralis* infestation than for any other parasitic condition. Sioe's¹³ report on the use of the dye in this condition was followed closely by that of de Langen;¹⁴ in addition, the experiments of Faust¹⁵ added considerably to our knowledge of the value of the drug in strongyloidosis.

EXPERIMENTAL PROCEDURE

Prior to treatment for pinworms, a clinical history was obtained and a physical examination made on each patient to ascertain whether any contraindications existed for the treatment. In addition to the diagnostic NIH swab examinations, a stool specimen from each patient was examined by one of the flotation techniques. When the stool examination showed eggs of *Ascaris lumbricoides*, the patient was treated for the removal of this parasite before gentian violet was prescribed.

10. Craig, Charles Franklin, and Faust, Ernest Carroll: *Clinical Parasitology*, Philadelphia, Lea & Febiger, 1937.

11. Young, Hugh H., and Hill, Justina H.: *The Treatment of Septicemia and Local Infections by Intravenous Injections of Mercuric Chromate-220 Soluble and of Gentian Violet*, J. A. M. A. 82: 675-676 (March 1) 1924.

12. Faust, Ernest Carroll, and Yao, Ke Fang: *Specific Therapy of Clonorchis Infections*, Arch. f. Schiffs- u. Tropen-Hyg. 50: 381-391 (Sept.) 1926.

13. Sioe, Kwa Tjaon: *Strongyloidosis and Its Treatment with Gentian Violet*, Far East. A. Trop. Med. Tr. 7 Cong. Calcutta (British Ind. [Calcutta] December 1927) 3: 200-204, 1928.

14. de Langen, C. D.: *Anquilulosis and the Syndrome of the "Pathic Hypercoagulability"*, Meded. v. d. dienst d. volkgezondh. Nederl.-Indië, foreign ed. 17: 515-529, 1928.

15. Faust, Ernest Carroll: *Strongyloides and Strongyloidosis*, Proc. parasitol. clin. y lab. 2: 315-341 (May-June) 1936.

5. Reardon, Lucy: *Studies on the Number of Eggs Produced by the Pinworm, and Its Bearing on Infection*, Pub. Health Rep. 54: 221-224 (Nov.) 1932.

6. Nolan, M. O., and Reardon, Lucy: *Studies on Oxyuriasis: XX. The Distribution of the Ova of Enterobius Vermicularis in Household Dust*, J. Parasitol. 25: 173-177 (April) 1939.

7. Wright, Willard H.; Bozicevich, John, and Gordon, Leon S.: *Studies on Oxyuriasis: V. Therapy with Single Doses of Tetrachlorethylene*, J. A. M. A. 109: 570-573 (Aug. 21) 1937.

8. Wright, Willard H.; Brady, Frederick J., and Bozicevich, John: *Studies on Oxyuriasis: XIV. Controlled Tests with Various Methods of Therapy*, Pub. Health Rep. 54: 2005-2016 (Nov. 10) 1939.

9. Brown, H. W.: *Treatment of Pinworm (Enterobius Vermicularis) Infestation with Hexylresorcinol*, Proc. Soc. Exper. Biol. & Med. 30: 221-224 (Nov.) 1932.

In order to check the efficacy of the treatment, seven consecutive daily NIH swabs have been made beginning at certain intervals after the completion of the treatment. Cram, Jones, Reardon and Nolan¹ have shown that six such swab examinations will detect nearly all pinworm infestations, while the work of Sawitz, Odom and Lincicome⁴ confirmed these observations and indicated that seven NIH swab examinations will disclose over 99 per cent of the positive cases. In the absence of precise information on the prepatent period of the pinworm, *Enterobius vermicularis*, the timing of these swabs has been based largely on the results of the self-infestation experiments of Leuckart,¹⁶ Grassi¹⁷ and Calandruccio,¹⁸ these experiments indicating apparently that gravid females of *E. vermicularis* begin to migrate between the fourteenth and the twenty-first day after infestation. On the basis of this evidence, the post-treatment swabs were started in a large number of patients on the tenth to the fourteenth day after the end of the treatment.

TREATMENT WITH ENTERIC COATED GENTIAN VIOLET TABLETS N. N. R.

In a preliminary communication, Wright, Brady and Bozicevich¹⁹ reported on the treatment of a total of 163 patients with enteric coated gentian violet tablets N. N. R., the post-treatment checks being made by means of seven consecutive daily NIH swabs beginning on the tenth to the twenty-first day following the end of treatment. The daily dosage of gentian violet prescribed for adults was that used by Faust²⁰ and for children that used by Kouri, Sellek and Rivera²¹ in the treatment of *Strongyloides stercoralis* infestations. Adults received two 32 mg. (one-half grain) tablets before meals three times daily. Individuals 16 years of age and younger received approximately 10 mg. a day for each year of apparent (not chronological) age. Thirty-six of the 163 patients were classed as non-cooperative, since they either failed to complete the treatment or failed to furnish post-treatment swabs; five patients were advised to discontinue treatment because of reactions that were due, in part at least, to the gentian violet therapy. Of the remaining 122 individuals 107, of whom eighty-five were under 16 years of age and twenty-two were over this age, were given the drug in daily doses over a period of ten days, while the remaining fifteen individuals, all children, received the drug over a period of eight days, were allowed to rest for seven days and were then treated for an additional period of eight days. A total of 112, or 92 per cent, of these 122 completed cases were negative on the post-treatment swab examinations. All of the fifteen patients receiving the divided course of treatment were negative.

Another series of patients comprising twelve children and three adults has completed treatment since the foregoing cases were reported. These patients were treated with the same dosage of the same type of tablet admin-

istered in two courses of eight days each with a week's interval between courses. Twelve, or 80 per cent, of the fifteen cases were negative on the post-treatment checks taken from fourteen to twenty-one days after completion of the treatment.

As opportunity presented itself, we continued observations on some of the negative patients over longer periods of time. Nineteen patients, mostly boys in an institution, were selected for a further check on freedom from infestation at intervals varying from seven weeks to thirty-four weeks following the end of treatment. The results of a recheck with seven additional daily post-treatment swabs indicated that fifteen of the nineteen individuals were still negative for pinworm ova at the aforementioned intervals after treatment. This result, as we were to learn later, was considerably better than that obtained when noninstitutionalized individuals were checked with post-treatment swabs beginning with the forty-second day after the end of the treatment.

In addition to this check, we kept under continuous observation for periods varying between thirty-eight and fifty-three days after the end of treatment four patients who were swabbed either once or twice a day during this time. At the end of these periods these patients were negative for pinworm ova on swab examinations.

The necessity of checking the validity of our assumption that the life cycle of the pinworm requires from fourteen to twenty-one days became apparent as the experiments progressed. If the parasite actually requires more than twenty-one days to develop to maturity, negative swabs taken prior to that time might give false information. Under such circumstances, young larvae not removed by the treatment might develop to maturity and ova from migrating worms would be deposited after the last swab examination had been made. Thus, in order to add to the critical value of our post-treatment checks, the post-treatment swabs on the remaining patients were started on the forty-second day after the end of the treatment.

Naturally, the prolonged time element in this type of experiment with patients over whom we could exercise no semblance of control adds considerably to the possibilities of reinfestation, since these patients were not hospitalized individuals but were outpatients who carried on their usual duties and maintained the customary routine of their lives. No doubt many of them were subjected to reinfestation with pinworm ova and possibly some of them acquired a reinfestation, in which event the positive observations on the post-treatment swabs would not indicate failure of the treatment. The longer the period between the termination of the treatment and the post-treatment swabs, the more likelihood there would be that positive results indicated a reinfestation and not failure of the treatment.

Further treatment with enteric coated gentian violet tablets N. N. R. was carried out on nineteen additional patients (fourteen children and five adults) and for these patients the post-treatment swabs were started on the forty-second day following the completion of the treatment. These patients were given the same course of treatment, i. e. the gentian violet was administered in the same dosage as used previously and was given over a period of eight days, stopped for seven days and then repeated for an additional period of eight days. Of the nineteen patients eleven, or 58 per cent, were negative on the post-treatment swabs.

16. Leuckart, Rudolph: Die menschlichen Parasiten und die von ihnen herrührenden Krankheiten, Leipzig and Heidelberg 2, part 2, pp. 257-512, 1868.

17. Grassi, R.: Note intorno ad alcuni parassiti dell' uomo, Gazz. d. osp. Milano 2: 433-439, 1881.

18. Calandruccio, S.: Animali parassiti dell' uomo in Sicilia, Atti Accad. Gioenia di sc. nat. in Catania 2: 95-135, 1889-1890.

19. Wright, Willard H.; Brady, Frederick J., and Bozicevich, John: Studies on Oxyuriasis: VIII. A Preliminary Note on Therapy with Gentian Violet, Proc. Helminthol. Soc. Washington 3: 5-7 (Jan.) 1938.

20. [Faust, E. C.]: Gentian Violet Therapy for *Strongyloides* Infection, Editorial, Internat. M. Digest 17: 57-58 (July) 1930.

21. Kouri, Pedro; Sellek, Antonio, and Rivera, Rafael: Sobre el tratamiento de la strongyloidosis por el violeta de genciana, Rev. parasitol. clin. y lab. 2: 7-16 (Jan.-Feb.) 1936.

TREATMENT WITH GENTIAN VIOLET TABLETS PROVIDED WITH A WATER SOLUBLE COATING

During the course of our experiments it had been occasionally reported to us that the stools of certain patients were not consistently colored by the dye during the course of treatment. In order to check on the disintegration of the tablets, all stools passed by five patients during the course of treatment were screened and it was found that these patients occasionally passed whole or incompletely disintegrated tablets.

As a result, we were interested in the suggestion of Dr. John F. Kessel that we try a tablet provided with a new type of water-soluble coating. Since Dr. Kessel's suggestion, the effectiveness of the new type of coating from the standpoint of timed disintegration of the tablets in the small intestine has been demonstrated radiographically by Worton, Kempf, Burrin and Bibbins.²²

The coating in question consists of the following ingredients in the proportions named: stearic acid 55.5, carnauba wax 24.25, petrolatum 1.75, powdered agar 13.9 and powdered elm bark 4.6.

Gentian violet tablets furnished us by the manufacturer were provided with coatings which permitted disintegration in two and one-quarter, four, four and one-half and five hours, respectively. Worton and his associates noted that the four and five-hour coated tablets invariably opened in the small intestine. We have found the four and one-half hour coated tablets to be as effective as any of the others and have prescribed tablets with this coating for persons of all ages. The preliminary results of these experiments were reported by Wright and Brady.²³

A total of 121 persons have been treated with gentian violet tablets with the water soluble type of coating. Of these, fifty-three cases were incomplete, the remaining sixty-eight persons (fifty children and eighteen adults) having taken the prescribed number of tablets and having furnished the required number of post-treatment swabs. The dosage of gentian violet for these cases was the same as that employed in the use of the enteric coated tablets. However, in this case the tablets were given one hour before meals. The treatment regimen consisted of two periods of eight days each, separated by a rest period of seven days. Seven consecutive daily swab examinations on these sixty-eight persons beginning on the forty-second day after the completion of the treatment showed fifty-four, or 79 per cent, to be freed from pinworms.

REACTIONS ENCOUNTERED IN THE GENTIAN VIOLET TREATMENT FOR PINWORMS

We have encountered similar untoward effects with both types of tablet used in these experiments. A total of 182 patients took the entire course of treatment with the enteric coated tablets, although only 156 (shown in the table) furnished the required number of post-treatment swabs. Of the 182 patients, 114 noticed no ill effects from the treatment. In the remainder, untoward symptoms occurred in the form of nausea thirty-four times, vomiting twenty-nine, diarrhea eighteen, constipation two, headache one, dizziness three, lassitude two and mild abdominal pain twenty-one. A total of eighty-eight patients completed

treatment with the water soluble type of tablet, although only sixty-eight furnished the necessary number of post-treatment swabs. Of the eighty-eight patients fifty-one had no ill effects from the drug. In the remainder nausea was encountered twenty times, vomiting eleven, diarrhea nine, constipation two, dizziness one, lassitude one and mild abdominal pain eleven. Three patients suffering, respectively, from cholecystitis, ear sickness and whooping cough reported vomiting. These cases are not included in the foregoing summary although the gentian violet may have been an aggravating factor in bringing on the vomiting.

All the reactions encountered may be attributed to an irritation of the gastrointestinal tract from the drug, although the symptoms of headache, dizziness and lassitude may have been due to some absorption of the drug. In a dog given 35.4 mg. of gentian violet daily for each kilogram of body weight we were able to recover from the urine on the twelfth to fourteenth days a small amount of a red substance that gave

Summary of Results of Treatment in 224 Cases of Oxyuriasis with Gentian Violet Tablets Administered Orally

Number of Completed Cases	Number of Courses of Treatment	Number of Days' Treatment in Each Course	Number of Days After Completion of Treatment Swabs Made	Number of Cases Negative on 7 Consecutive Daily Post-Treatment Swabs	Number of Cases Positive on 7 Consecutive Daily Post-Treatment Swabs	Percentage of Cases Negative
Enteric Coated Gentian Violet Tablets N. N. R.						
107*	1	10	10 to 21	97	10	91
30	2†	8	14 to 21	27	3	90
19	2†	8	42 to 48	11	8	53
Water Soluble Coated Gentian Violet Tablets						
68	2†	8	42 to 48	54	14	79
Total 224	..	..	.....	189	35	81

* Fifteen of nineteen cases in this series were negative on ^{seventy-two} additional post-treatment swabs taken at intervals of seven to thirty-four weeks after the end of the treatment.

† Treatment was discontinued for one week between courses.

chemical reactions of a rosaniline derivative. Similar occurrences have never been noted with patients treated for pinworms. The pigment noted in the sections of the liver, spleen and kidneys of experimental animals treated with relatively large doses of the drug may have been due to absorbed dye. However, there has been no evidence to indicate that an appreciable amount of the dye is absorbed with the dosage used in the treatment for pinworms. It was observed that many of the patients having reactions had ill effects during the first several days of treatment. Many of these individuals were able to complete the treatment without further reaction even though there was no reduction in the dosage of the drug. In some cases it was necessary to withhold treatment for a day or two or to reduce the dosage until the reactions subsided. All reactions were temporary in nature.

CONTRAINDICATIONS FOR GENTIAN VIOLET THERAPY

It has been our practice never to use gentian violet treatment for pinworm patients having a concomitant infestation with *Ascaris lumbricoides* until removal of the ascarids. Little is known concerning the action of the drug on this parasite and we feared possible intestinal obstruction from the clumping of ascarids, such as has been reported with some other anthelmintics. We have not used gentian violet for cases in which

22. Worton, A. G.; Kempf, G. F.; Burrin, P. L., and Bibbins, F. E.: A New Enteric Coating and a Laboratory Method for Its Control, *J. Am. Pharm. A.* 27: 21-28 (Jan.) 1938.

23. Wright, Willard H., and Brady, Frederick J.: The Treatment of Oxyuriasis with an Improved Type of Enteric Coated Tablet, *J. Parasitol.* 24 (Supp.): 9-10 (Dec.) 1938.

there might be cardiac, hepatic or renal disease of an appreciable degree. Disease of the gastrointestinal tract is considered also to be a contraindication for gentian violet therapy. Abstinence from alcohol is recommended during the period of treatment. While in our experience small children have not reacted poorly to gentian violet, we have had a few cases of children under 3 years who have been unable to swallow the tablets without rupturing the coating. In these cases we have had to resort to the use of enemas for the treatment of the pinworm infestation.

THE TOXICITY OF GENTIAN VIOLET

Faust²⁰ noted that man and laboratory animals could tolerate daily oral doses up to 35 mg. per kilogram of body weight. The number of such doses tolerated was not stated.

We have given gentian violet in gelatin capsules orally to fifteen rabbits and found the minimum lethal dose for this short series to be 22 mg. per kilogram of body weight given daily for six days. A dog given gentian violet in enteric coated tablets in a daily dose of 35.4 mg. per kilogram of body weight survived treatment for eighteen days; another dog given 40.1 mg. of gentian violet per kilogram daily died after eighteen days of dosing. The maximum dose used for the treatment of pinworm infestation is about 3.5 mg. of gentian violet per kilogram of body weight daily for a total of sixteen days with a week's rest between two eight-day courses. This amount is about one sixth of the minimum dose causing death in rabbits given the drug in gelatin capsules and about one tenth that for dogs given the dye in enteric coated tablets.

In laboratory animals, gentian violet intoxication is manifested by anorexia, vomiting and diarrhea. With severe intoxication, these symptoms are followed by apathy and death. In the dog given 35.4 mg. of gentian violet per kilogram of body weight the erythrocyte count increased from 4,790,000 to 6,930,000 cells per cubic millimeter, the leukocyte count dropped from 23,200 to 12,450 cells and the differential count remained about the same throughout the experiment with from 65 to 74 per cent neutrophilic polymorphonuclear leukocytes. In the dog dying after eighteen days of dosing with 40.1 mg. of gentian violet per kilogram of body weight daily, the blood nonprotein nitrogen remained within normal limits until three days before death, when it began to rise rapidly.

Experimental animals given gentian violet were grossly normal at autopsy except for a moderate congestion of the intestinal mucosa and evidences of dehydration. Microscopically the liver and spleen of our experimental animals generally showed a moderate degree of congestion and in most cases the cells in the liver, spleen and kidneys showed the inclusion of a granular pigment; several animals showed a slight hydropic degeneration of the epithelium of the convoluted tubules of the outer renal cortex.²¹

COMMENT

The accompanying table presents the results of the 224 cases comprising the various series of treatments. It will be seen that there was practically no difference in the percentage of efficacy between the ten-day treatment and the sixteen-day treatment with post-treatment swabs taken between the tenth and twenty-first days after the end of treatment in the former and between the fourteenth and twenty-first days in the latter.

Theoretically it might be expected that the sixteen-day treatment would result in a greater percentage of cures for the reason that the total period covered is twenty-three days, including the seven-day rest period between courses. Compared to the ten-day treatment period, this period would provide more time for the desiccation of ova in the patient's surroundings and reduce the chance of reinfestation. It is possible that a larger series of cases treated over a period of sixteen days might show an advantage in this regimen over that of the ten-day treatment.

The efficacy of the enteric coated tablets in nineteen cases in which post-treatment swabs were started on the forty-second day after the end of the treatment was only 58 per cent. We have discussed previously the possibility of reinfestation in these cases and it seems probable that some of the positive cases may represent reinfestations.

A total of fifty-four, or 79 per cent, of sixty-eight cases treated with the water soluble coated tablets were negative on post-treatment swab examinations. In all these cases, these swabs were taken between the forty-second and forty-eighth days after the end of the treatment. The efficacy of these tablets may thus be compared directly with that in the nineteen cases treated with the tablets provided with the enteric coating. The comparison would appear to be favorable to the former type of tablet. However, critical consideration of the data indicates that the chance variations in the two percentages of efficacy overlap; consequently a comparison would have to be based on a much larger series of cases in the two groups before valid conclusions could be drawn.

There is no practical method for determining the degree of infestation in pinworm cases, and the NIH swab gives no clue as to the number of worms harbored. However, impressions of the degree of the infestation are gained by the history of the frequency of migrations and the number of swabs found positive in a long series. With these impressions in mind, it has appeared to us that the persons with lighter degrees of infestation are cured more easily than those harboring large numbers of pinworms, a number that may reach into the thousands. Theoretically, heavy pinworm infestations would involve the presence of large numbers of developing larvae in the upper intestinal tract. These larvae are more difficult to remove than are adult worms and it appears that some of the failures of gentian violet to eradicate heavy pinworm infestations are due to the failure of the drug to remove the numerous developing forms.

SUMMARY

Experimental treatment with gentian violet administered in repeated oral doses has been completed on a total of 224 individuals; these patients were treated on a familial basis, each member of the family having been examined for pinworms and all infested individuals having been treated simultaneously with the view of eliminating at one time all sources of infestation within the household. A case history was obtained and a physical examination made on each individual to determine whether contraindications for the treatment were present. Pinworm diagnoses were made by means of the NIH cellophane tipped anal swab, while examinations for other helminth ova were made on stool samples by means of one of the flotation techniques. The dosage of the drug for adults was two 32 mg. tablets three

²¹ Dr. L. L. Ashburn, Passed Assistant Surgeon, Division of Pathology, National Institute of Health, made the pathologic examination of this material.

times a day before meals and for children 10 mg. a day for each year of apparent (not chronological) age, the total daily amount of the drug for children being divided also into three doses. The efficiency of the treatment was checked by the use of seven consecutive daily NIH post-treatment swabs. The patients were treated in four series, as follows:

One series of 107 patients received enteric coated gentian violet tablets N. N. R. daily for a period of ten consecutive days. Post-treatment swabs taken in these cases from ten to twenty-one days after the completion of the treatment indicated that ninety-seven, or 91 per cent, were negative for pinworms.

Thirty patients were treated with enteric coated tablets over a period of eight days, were allowed to rest for seven days and were then treated for an additional period of eight days. Of these thirty patients twenty-seven, or 90 per cent, were negative on post-treatment swab examinations taken between the fourteenth and twenty-first days following the end of the treatment.

The third series involved the treatment of nineteen individuals with enteric coated tablets over a period of sixteen days with a week's rest between the eight-day treatment periods. Of these patients eleven, or 58 per cent, were negative on post-treatment swab examinations made from the forty-second to the forty-eighth day following the end of the treatment.

In the fourth series sixty-eight patients were treated with gentian violet tablets provided with a water soluble coating designed for disintegration in the small intestine at approximately four and one-half hours after administration. These patients were given the sixteen-day treatment with the usual seven days rest period between two eight-day courses. The tablets were given one hour before meals. Fifty-four, or 79 per cent, of the sixty-eight patients were negative for pinworm ova on seven consecutive daily post-treatment swabs taken from the forty-second to the forty-eighth day following the end of the treatment.

A certain percentage of the treated patients suffered reactions in the form of nausea, vomiting, diarrhea and abdominal pain but the reactions were of a temporary nature and quickly subsided when the dosage of the drug was reduced or the treatment was discontinued for a period of a day or two.

Contraindications for the use of gentian violet include concomitant infestations with *Ascaris lumbricoides*, moderate to severe cardiac, hepatic or renal disease, alcohol and diseases of the gastrointestinal tract.

The minimum lethal dose of gentian violet for rabbits was 22 mg. per kilogram of body weight daily for a period of six days. One dog tolerated a dose of 35.4 mg. per kilogram daily for eighteen days. No pathologic tissue changes have been found to account for the death of experimental animals succumbing to the administration of gentian violet.

Gentian violet was found to be eminently superior to some and superior to all the other methods of therapy tested under similar conditions and checked by the same technic. Because of its relative cheapness, its ease of administration and its relatively high degree of efficacy, the drug is apparently of greater value than are other known drugs for the treatment of pinworm infestation in families in which many individuals may be infested and in which simultaneous treatment of all infested individuals appears to be necessary for the control of the condition.

Clinical Notes, Suggestions and New Instruments

A GREAT CRAVING FOR SALT BY A CHILD WITH CORTICO-ADRENAL INSUFFICIENCY

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Special food cravings or aversions have received only passing interest in modern medicine and have been almost entirely neglected in modern nutrition. This is due to the prevalent view that appetite cannot be trusted as a guide to the proper selection of foods. Results of experiments on rats using the self-selection technic indicate, on the contrary, that a very close relationship exists between appetite and nutritional needs of minerals and vitamins, as well as of fats, carbohydrates and proteins. In human beings there are only a few instances which throw light on the relationship between appetite and dietary needs. Davis¹ reported that when very young normal children were given free access to a large number of natural foods they made selections which resulted in normal growth and development. She also reported that a child with vitamin A deficiency took large amounts of cod liver oil and thereby caused the deficiency symptoms to disappear.

During the past year we had occasion to make in this hospital a clinical observation which demonstrates in a very striking way the close relationship between appetite and nutritional needs. The endocrinologic aspects and the full medical history of this case have been reported in detail by Wilkins, Fleischmann and Howard.² The following data were taken from their history:

REPORT OF CASE

D. W., a boy aged 3½ years, admitted to the Harriett Lane Home for Children, showed a marked development of his secondary sex organs. His penis and testes were as large as those of a 12 year old boy. The prostate was fairly well developed; spermatogenesis was absent. Over the pubis there was a rather abundant growth of long dark hair. The voice was deep and the laryngeal cartilage was as prominent as that of a full grown man.

The skin on his scalp and body had a slightly brownish hue; the alveoli of the nipples were pigmented and the gums over the upper incisors showed a patch of brownish pigmentation.

His blood had a low sodium and a high nonprotein nitrogen content. Other physical observations were negative.

In the hospital the boy did not seem to be especially ill. He behaved like a very defective child, growling and snarling in an incoherent manner when attempts were made to examine him. He was offered the regular ward diet. His appetite was poor and he ate but little of the food. When feedings were forced, he vomited on several occasions. Seven days after admission he suddenly died.

Postmortem examination revealed that both adrenals were large. There was hyperplasia of the androgenic or prenatal zone cells, with marked diminution of the normal cortical cells. The testes were composed of similar cells crowding out the seminiferous tubules. Otherwise no pathologic changes were found. The precocious development of the secondary male sex characteristics was thought to be due to the embryonic hyperplasia of the androgenic zone of the adrenal. It appeared that death from adrenal insufficiency resulted from destruction of the electrolyte-controlling elements of the adrenal cortex.

One of the interesting features of this case was the presence of a great craving for salt. After his death it was learned that from the age of 12 months the child had eaten salt in large quantities. In addition, he had been given saline enemata

These observations form part of a study of the "Influence of Hormones on Appetite," supported by the Committee on Research in Endocrinology of the National Research Council.

From the Harriett Lane Home for Children and the Psychiatric Laboratory, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital.

1. Davis, Clara M.: Self Selection of Diet by Newly Weaned Infants. *Am. J. Dis. Child.* 36: 651 (Oct.) 1923.

2. Wilkins, Lawson; Fleischmann, W., and Howard, J. E.: *Endocrinology*, to be published.

every second or third day because of constipation. Subsequently a full account was obtained from the parents concerning the onset and development of this craving. The following letter, which is one of the most extraordinary documents on behavior on record, was written by the parents in response to a few questions regarding their child's special appetites:

"Dear Dr. —:

"Since receiving your letter it has been on my mind constantly to remember as nearly as possible the correct answers to all of your questions. We want to thank you for your very nice letter and are glad to help in any way we can.

"Some of the things I am writing you I know are not direct answers to your questions, but indirectly I feel that they may be of some help to you and perhaps explain how we had studied D— and his peculiarities. Of course, in the beginning we knew that he was very sick, but did not know his true condition or what to expect.

"We had such a hard time trying to find milk to agree with him that I remembered exactly when each kind was changed; but when he first started eating salt I didn't think it was so important until later when he started craving it.

"With his feeding problems we only gave one new food at a time and took particular notice of the reaction it had on him. At six months we still didn't have any one milk to agree with him for any length of time except mother's milk. At this time Dr. — told us to start giving him strained vegetable soup and beef broth. He liked it, but as soon as it touched his tongue he would gag and bring up everything he had in his stomach unless I made it very thin with the beef broth. About a month later we started giving him strained vegetables; but, no matter what it was, he would bring it all up immediately unless it was very thin, practically liquid. At this time the doctor told us to give him crackers and zwieback; but as soon as he got any crumbs or little pieces of food on his tongue he would gag and bring up everything else. I would keep trying him from time to time thinking that perhaps the next time he would do better.

"When he was around a year old he started licking all the salt off the crackers and always asked for more. He didn't say any words at this time, but he had a certain sound for everything and a way of letting us know what he wanted. This was the first we had noticed his wanting the crackers or salt. Finally he started chewing the crackers; but he only chewed them until he got the salt off, then he would spit them out. He did the same with bacon, but he didn't swallow the pieces. When he was about sixteen months old, crackers were the first food he chewed and swallowed; but it was quite a while after that before he would chew up and eat a whole cracker. He would usually just make a mess of them eating the salt off.

"In an effort to try to find a food that he would like well enough to chew up and swallow, we gave him a taste of practically everything. So, one evening during supper, when he was about eighteen months old, we used some salt out of the shaker on some food. He wanted some, too. We gave him just a few grains to taste, thinking he wouldn't like it; but he ate it and asked for more. This was the beginning of his showing that he really craved salt, because this one time was all it took for him to learn what was in the shaker. For a few days after that, when I would feed him his dinner alone at noon, he would keep crying for something that wasn't on the table and always pointed to the cupboard. I didn't think of the salt, so I held him up in front of the cupboard to see what he wanted. He picked out the salt at once; and in order to see what he would do with it, I let him have it. He poured some out and ate it by dipping his finger in it. After this he wouldn't eat any food without having the salt, too. I would purposely let it off the table and even hide it from him until I could ask the doctor about it. For it seemed to us like he ate a terrible lot of plain salt. But when I asked Dr. — about it, he said, 'Let him have it. It won't hurt him.' So we gave it to him and never tried to stop it altogether. After we gave it to him all the time he usually didn't ask for it with his dinner; but he wouldn't eat his breakfast or supper without it. He really cried for it and acted like he had to have it. Foods that he ordinarily wouldn't touch he would eat all right if I added more salt to them. He would take the shaker and pour some out on his plate and eat it with his finger, but we always tried to keep him from getting what we thought would be too much for him. He never did care much for zwieback, toast or bread or for cooked potatoes, but he did like raw potatoes, raw carrots, celery, tomatoes, lettuce and different other foods if he could dip them in salt. If I didn't give it to him, he always asked for it. At eighteen

months he was just starting to say a few words, and salt was among the first ones. We had found that practically everything he liked real well was salty, such as crackers, pretzels, potato chips, olives, pickles, fresh fish, salt mackerel, crisp bacon and most foods and vegetables if I added more salt. We never tried to force him to eat a food; I always tried to prepare the same food in a way that he would like it. Spinach and green beans were his favorite vegetables. By letting him taste different foods he learned to like quite a variety, although he was three years old before he really ate a good meal by chewing it and swallowing it. In the meantime, I kept feeding him strained foods with the beef broth. . . . As he grew older and ate better, he very seldom brought up his meals any more. But he always wanted a lot of vegetable juice on his foods before he would eat them. If I didn't give it to him, he would ask for it and would eat everything good; but he wanted the salt too. By the time he was three years, I could reason with him and make him understand when he had enough of anything. At the time we had no idea as to the amount of salt he ate, or what the result would be if he didn't have it; but we have measured it now and would say that he ate between three quarters to one teaspoon of plain table salt a day in addition to all his foods being saltier than ours. If he ate a food without it, I let him go; but if he wanted more salt in it, I added a little more. Many times I tried to make him think I added it, but he always knew the difference with the first taste. Some days he may have had a little more or less than the amount stated, which is, as we would judge, the average.

"He would not eat anything sweet, though. Mostly everything with much sugar in it he would either bring back up or just *wouldn't eat it*. He would not eat cereal with sugar and milk on it. I would always strain his cereal into his glass of milk and let him drink it. Wheaties, or any small amount of dry cereal I tried to give him, he would not eat with sugar and milk but wanted it dry with salt sprinkled on. He *did not* like candy, cake, custards, puddings, etc. He *did* eat a little ice cream or jello.

"He was a very observing baby and, even in his sickly condition, started noticing pictures in books when he was six months old. He always liked books, and we would read to him quite a lot. When he was about two years old he began reading the pictures himself. He would get out one book after another and never seemed to grow tired of reading them. Many times he surprised us by knowing and recognizing things in the pictures we hadn't even noticed. And by the time he was three and a half he knew a few words by sight. When he was two and a half he loved to hunt for the attractive pictures of the good foods in the magazines. He learned to know what all the foods were and made believe he ate them. It was surprising to us to see how this improved his appetite at meal time, for it was at this time that he started chewing his foods better and acted like he really enjoyed them. Another thing that helped him learn to eat was because he became interested in cooking. Many times he would play for an hour or more making believe he was cooking his Daddy's supper and imagining all kinds of foods he was cooking.

"There was no other one food that he seemed to crave like salt, except water. Many people seemed to think this was because he ate so much salt, but he liked lots of water to drink from the time he was four months old. At six months, if we showed him a bottle of water and one of milk, he would take the water in preference to the milk *every time*. And in studying him, we found that by giving him lots of water he would be able to belch easier and so keep his milk down better. He learned to know himself that it helped him. As soon as he knew what the word 'water' meant, he would cry for it every time he heard the word mentioned. And when he saw the river or the ocean, he always thought he had to have some to drink until we were finally able to explain to him that it wasn't drinking water. But up until the time we took him up there he still wanted water every time he saw anybody else drink it. He always asked for it many times between meals; and if there was water on the table at meal time he would rather drink it than eat his meal. And if we let him drink and eat too much without making him stop to belch in between, his food would come back up almost every time. Also, if we let him cry much, he could not keep anything in his stomach.

"At home he acted and played the same as any perfectly normal child. But the doctor had told us not to take him anywhere among people because of contracting contagious diseases, which he didn't think D— could pull through. The result was that he was afraid of strangers; and when we brought him up there it was the first time that he was among

complete strangers and strange surroundings. We had never been away from him ourselves before. Either my husband or I were always with him to take care of him.

"I hope that I have answered all of your questions satisfactorily and also that at least part of what I have written will be of some help to you. In order to remember the answers as nearly correct as possible, it was necessary for me to recall D—'s whole life. If there is anything at all that I have omitted don't hesitate to let us know. We will be glad to answer it if we can. As for the different kinds of milks we gave him and the age when each one was changed, also his growth and development, I had those recorded on the backs of the pictures I sent you sometime after we returned from up there.

"Hoping we have been able to help you in your studies and perhaps some children in the future, we are,

"Yours very truly,

"MR. AND MRS. —."

COMMENT

The full significance of the craving for salt by this child can be obtained from a review of our knowledge of salt craving by adrenalectomized animals.

It is well known that in rats kept on the ordinary stock diets symptoms of insufficiency develop and the rats die within ten to fifteen days after adrenalectomy. Death occurs largely because of the excessive loss of sodium chloride in the urine and the resulting changes in the internal osmotic conditions.³ It is known that the survival time can be increased and the mortality rate decreased by increasing the salt content of the food until it approximates the amount of salt lost in the urine. Further, it was shown that when adrenalectomized rats have access to salt in a container separate from the food they will ingest large amounts of salt and, as a consequence, keep themselves alive and free from symptoms of insufficiency.⁴ Some of the rats ingested from fifteen to twenty times as much of a 3 per cent salt solution thirty days after adrenalectomy as they had in the last ten day preoperative period. That the increased salt appetite depended on the loss of the adrenals was demonstrated by the observation that adrenals successfully implanted to the anterior chamber of the eyes caused the craving to disappear entirely.

This increased craving for salt manifested by adrenalectomized rats is not an isolated instance of a mineral or food craving which is closely related to dietary needs. We⁵ have reported that parathyroidectomized rats have an increased appetite for calcium, magnesium and strontium salts, which are known to decrease parathyroid tetany, and that they have a decreased appetite for phosphorus. We found also that pregnant and lactating rats given free access to a large selection of minerals, vitamins, purified (or nearly purified) fats, proteins and carbohydrates, all in separate containers, make selections in accordance with their needs. They increased their intake of calcium, phosphorus, protein and fat.

There can be little doubt, then, that with his increased salt craving the 3½ year old boy with deficient adrenal cortical tissue made an effort to maintain a normal internal salt balance. Apparently he started as early as eleven months after birth. During the two and one half years previous to his entrance to the hospital he must have kept himself alive by eating large amounts of salt. In the hospital he was not given free access to salt but was given the regular ward diet, which contains the normal amount of salt and, as a result, died suddenly.

The basis for special cravings has not yet been established. We do not know whether the adrenalectomized rats eat large amounts of salt because the ingestion of salt makes them feel better or because their taste for salt has changed—in other words, that in their salt deficient state they become chemotropically attracted to salt. In favor of the latter view is the observation that adrenalectomized rats have a greatly decreased

threshold for salt. They distinguish distilled water from 5% solution in a 1:33,000 concentration, while normal rats do not make this distinction until the salt solution reaches a concentration of 1:2,000.⁶ Such minimal amounts of salt as are received in drinking a few cubic centimeters of a 1:33,000 solution could not possibly have any physiologic effect. This boy also showed a positive reaction to salt when he first tasted it in pure form in very small quantities on the top of soft crackers. It is not readily conceivable that such a small amount of salt could have had any detectable effect on his deficiency condition.

SUMMARY

A boy aged 3½ years with deficient adrenal cortical tissue, manifesting various symptoms of adrenal insufficiency, had a marked craving for salt. On the basis of observations made on adrenalectomized rats, it would seem that this boy, by increasing his salt intake, kept himself alive for at least two and one half years.

A NEW TUBE FOR USE IN THE TREATMENT OF EMPYEMA BY OPEN DRAINAGE

LEON J. LEAHY, M.D., BUFFALO

It appears to be generally accepted that cases of empyema must be individualized and the proper treatment instituted to meet the conditions present. The chief factors influencing this are the age of the patient, the character of the exudate and the presence of complications. In most large series it is noted that the vast majority of cases require open drainage, such other methods as aspiration and closed drainage being resorted to for the instances in which it is felt that the open method is either unsafe or not warranted. At times one of these procedures is used as a preliminary measure before establishing open drainage.

In instituting and maintaining open drainage I have encountered several difficulties which, although of a minor nature, could easily contribute to chronicity or recurrence if they were not recognized early or handled properly. The first of these has to do with the prevention of the tube from either slipping into the pleural cavity or coming out with the dressing. Sutures through the tube are satisfactory only until such time as they slough through the skin. A safety pin inserted through the tube and held to the chest wall with adhesive tape is an acceptable makeshift. However, the strips become readily loosened by the moisture from drainage and irrigations, thus allowing



Fig. 1.—Tube and flanges bent forward for introduction into the pleural cavity.

the tube to slip out of the pleural cavity unless care is exercised. As the inner end of the sinus closes very readily after the end of the tube has come out of the pleural cavity, reintroduction of the tube is often unsatisfactory. The next problem has to do with the inner end of the tube; it can easily be allowed to project into the pleural cavity for a distance of 1 or 2 inches, and with the use of modern gum rubber tubing it is difficult to recognize this fact even on the x-ray film without the injection of an opaque substance. I feel that if the end of the tube is not at the level of the parietal pleura the portion of the pleural cavity about the drainage tube is not kept emptied. This is in spite of secondary openings made in the sides of the tube, as these seem to become plugged with fibrin or granulations. There is the added factor of increased morbidity because the lung in reexpanding comes in contact with the end of the tube, and I feel that the speed of reexpansion

3. Loeb, R. F.: *Proc. Soc. Exper. Biol. & Med.* **30**: 808 (March) 1933. Harrop, G. A.; Soffer, L. J.; Ellsworth, Read, and Trescher, J. H.: *J. Exper. Med.* **58**: 17 (July) 1933. Rubin, M. L., and Krick, E. T.: *Proc. Soc. Exper. Biol. & Med.* **31**: 228 (Nov.) 1933.
4. Richter, C. P.: *Am. J. Physiol.* **115**: 155 (March) 1936.
5. Richter, C. P., and Eckert, J. F.: *Endocrinology* **21**: 50 (Jan.) 1937. Richter, C. P., and Eckert, J. F.: *Am. J. M. Sc.* **198**: 9 (July) 1939.

6. Richter, C. P.: *Endocrinology* **24**: 367 (March) 1939. From the Department of Surgery, University of Buffalo School of Medicine. The instrument is made by the George P. Pilling & Son Company, Philadelphia.

is slowed up from this point onward and a small residual pocket is left which is not obliterated until the tube is entirely withdrawn from the pleural cavity. The possibility of pressure necrosis on the surface of the lung from contact with the tube with resultant bronchopleural fistula or bleeding is likewise present. Finally, to accomplish irrigation of the empyemic cavity it is necessary either to introduce a second tube or to irrigate through the large tube. The former method is rather inconvenient and the latter method often serves to wash large plugs of fibrin back into the pleural cavity.

To overcome the difficulties mentioned, I have designed a tube for open drainage which has been entirely satisfactory in my hands. This tube is of sufficient caliber to provide

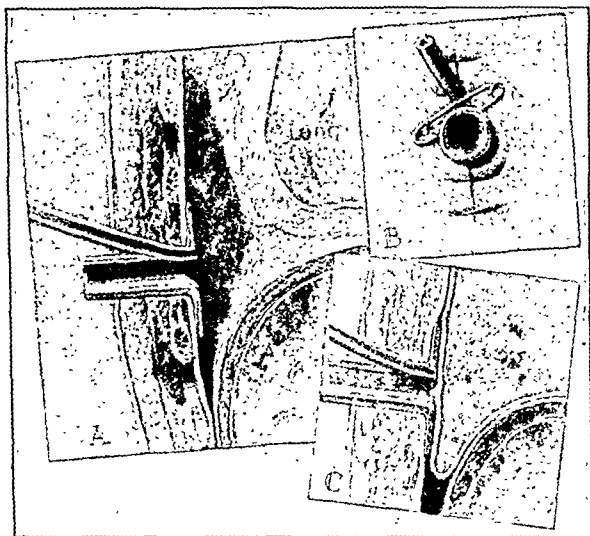


Fig. 2.—A, cross section showing tube in position with relationship of the inner end to the parietal pleura. B, appearance of the outer end with pin in place and wound closed. C, cross section showing tube in position following reexpansion of the lung.

adequate drainage for even thick fibrin and has a small tube incorporated for secondary irrigations. There are two flexible rubber flanges on the inner end, which prevent the tube from slipping out of the pleural cavity. In addition they keep the point of drainage at the level of the parietal pleura, thereby allowing the lung to reexpand to the chest wall without striking the tube and also obviating the danger of pressure necrosis on the pulmonary surface. The safety pin is put through the tube at the skin level and in this manner the tube is made self retaining and consequently cannot slip into or out of the pleural cavity. No adhesive tape is necessary, and the only sutures used are interrupted sutures, employed to approximate the edges of the wound. Owing to the variation in thickness of the chest wall, depending on the site of operation and the build of individual, the safety pin has proved the most satisfactory handling of this problem. This tube is easily introduced, as the flanges are flexible and the gussets cut in the sides allow them to be bent forward. These also permit easy withdrawal following reexpansion of the lung. There is no necessity for removal of the tube until the empyemic cavity is obliterated.

SUMMARY

A new tube for open drainage in empyema is presented which has the following advantages:

1. It is easily introduced and withdrawn.
2. It is self retaining.
3. It can be reused many times.
4. It has adequate provision for secondary irrigations without the use of another tube.
5. The inner end of the tube is flush with the chest wall, therefore allowing more satisfactory drainage of the pleural cavity and complete reexpansion of the lung and obviating the danger of pressure necrosis

40 West North Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

SCANLAN-MORRIS OXYGEN REGULATORS ACCEPTABLE

Distributor: The Scanlan-Morris Company, Madison, Wis.

Manufacturer: The Bastian-Blessing Company, Chicago.

Designed to meter the flow of oxygen, the Scanlan-Morris Oxygen Regulators are applicable to anesthesia apparatus, oxygen tents, nasal catheters and any similar oxygen therapy chambers. The numbers of the models distributed by Scanlan-Morris are A1473, A1474 and A1475, and these are designated by Bastian-Blessing as G-6121, G-6161 and T-6162 respectively.

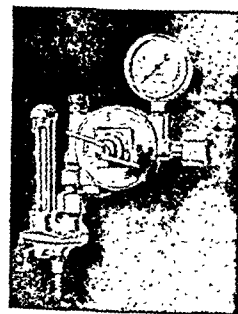
The model A1473 is a single stage regulator provided in different sizes and with various types of flow-indicating and control units. The larger sizes provide greater durability and accuracy of control. The gas may enter the inlet of the regulator at varying pressures up to 2,000 pounds. The gas is released at the outlet by turning a screw until the gage connected to the expansion chamber of the regulator registers the desired flow. The valve on the outlet is so regulated by a spring and diaphragm that any desired volume of gas at a fixed pressure can be obtained. Vent holes are provided to release pressure in the event of the failure of the diaphragm. The regulator bonnets are also built with a shearing edge that cuts the diaphragm and allows the gas to escape before any dangerous excess pressure can build up.

The model A1474 is a double stage regulator equipped with a dial type, Bourdon tube, liter-flow indicating gage, which is calibrated in liters per minute from 0 to 15 against a fixed orifice of discharge. A simple discharge outlet permits the discharge only of the volume of gas indicated on the flow meter.

The model A1475 is also a double stage regulator but is equipped with a Thorpe tube flow indicator, consisting of a vertical tube of resinous plastic material highly resistant to fracture. A stainless steel flow ball indicates the relative volume of oxygen discharge against a calibrated plate, which is fixed to the reinforcing sleeve around the Thorpe tube. To facilitate the adjustment for various volumes of flow, the inlet of the Thorpe tube is provided with a restrictive orifice which acts as a choke. This device is also equipped with a spring valve by-pass, permitting a direct discharge of oxygen from the regulator to the outlet without passing through the flow indicator. This is to provide oxygen more rapidly in cases of emergency.

Both of the two-stage models are available with and without by-pass valves. In both models the variation in flow is accomplished directly by varying the pressure against restricting orifices. The discharge pressure beyond the orifices in all cases is nominally at atmospheric pressure.

When the gas pressure is regulated in two stages, the first stage pressure setting is fixed at the factory to deliver gas at a pressure of 150 pounds to the second stage. This setting allows an adjustable delivery range from 0 to 75 pounds from the outlet of the unit. By entirely releasing or removing the adjusting screw at the first stage, one reduces the flow to the second stage from 150 to 75 pounds. This permits a greater sensitivity to the new 0 to 55 pounds delivery range provided by the second stage adjustment. Positively connected seat and diaphragm assemblies are employed in a nozzle type first stage and a stem type second stage, in which neither stage depends on springs to shut off the gas. The claim is made that a positively constant delivery pressure is maintained as the cylinder pressure diminishes from 2,000 down to about 45 pounds, permitting the use of approximately 98 per cent of the contained gas in a cylinder without readjusting the flow rate.



Scanlan-Morris Oxygen
Regulators,
Model 1475.

A filtering device is incorporated in the inlet, consisting of two cylindric sections of monel mesh screen between which is an inert filtering compound. This is to eliminate destructive wear on the seat by preventing the entrance of finely divided particles of dirt. Located between the first and second stages is a spring-loaded safety relief valve, which is set to function at 300 pounds pressure to protect the inlet of the second stage against possible excess pressure coming from the first stage in the event that the first stage did not close off at 150 pounds pressure. The firm states further that, if anything should happen to the safety device, the first stage is so built that it can withstand 2,000 pounds pressure. In order to substantiate the efficiency of the regulator in maintaining a constant delivery pressure with a lowering of the cylinder pressure, the firm submitted comparative curves for this regulator and six other competitive regulators. One group of tests was made with the delivery pressure set at 5 pounds and a second group with the delivery set at approximately $1\frac{3}{4}$ pounds (the weight of a 50 inch column of water). In all cases the regulator under consideration gave a straight-line curve down to about the last 50 pounds pressure in the cylinder.

The regulators were submitted for a Council investigation, from which it was determined that they are well constructed and satisfactory. The flow meter is sufficiently accurate for clinical use at the indicated liter levels. It appeared to hold a given indicated rate of flow over long periods of time.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Scanlan-Morris Oxygen Regulators for inclusion on the Council's list of accepted devices.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT OF THE COUNCIL

SULFATHIAZOLE AND SULFAMETHYLTHIAZOLE

FOLLOWING THE INTRODUCTION OF SULFAPYRIDINE IT WAS TO BE EXPECTED THAT RESEARCH LABORATORIES WOULD PREPARE OTHER DERIVATIVES OF SULFANILAMIDE FOR PURPOSES OF INVESTIGATION. RECENTLY THERE HAVE BEEN REPORTS THAT TWO DERIVATIVES IN PARTICULAR, SULFATHIAZOLE (2(PARA-AMINO-BENZENE-SULFONAMIDO) THIAZOLE) AND SULFAMETHYLTHIAZOLE (2(PARA-AMINO-BENZENE-SULFONAMIDO) 4-METHYLTHIAZOLE) GIVE SOME PROMISE OF THERAPEUTIC MERIT. THE COUNCIL HAS NOT GIVEN CONSIDERATION TO THE ACCEPTABILITY OF THE NAMES SULFATHIAZOLE AND SULFAMETHYLTHIAZOLE. THE MEDICAL PROFESSION HAS SUCH INTEREST IN SULFANILAMIDE AND ITS DERIVATIVES THAT DR. PERRIN H. LONG WAS ASKED IF HE WOULD PREPARE A PRELIMINARY REPORT ON THESE TWO SUBSTANCES. THE COUNCIL CONCURS WITH HIS CONCLUSIONS AND EXPRESSES ITS APPRECIATION OF DR. LONG'S AID.

THE TWO PREPARATIONS HAVE NOT BEEN LICENSED BY THE FOOD AND DRUG ADMINISTRATION FOR SALE IN INTERSTATE COMMERCE (AS NEW DRUGS). THIS GIVES OPPORTUNITY FOR THE MEDICAL PROFESSION TO BE INFORMED ABOUT THE DRUGS BEFORE THEY ARE EXPLOITED. NO FIRM HAS SUBMITTED THESE DRUGS FOR CONSIDERATION BY THE COUNCIL. THE COUNCIL ADOPTED DR. LONG'S REPORT AND HAS AUTHORIZED ITS PUBLICATION AS A PRELIMINARY REPORT OF THE COUNCIL.

PAUL NICHOLAS LEECH, Secretary.

THIAZOLE DERIVATIVES OF SULFANILAMIDE

SULFATHIAZOLE AND SULFAMETHYLTHIAZOLE

PERRIN H. LONG, M.D.

BALTIMORE

Recently, Fosbinder and Walter¹ have described the preparation of certain sulfanilamide derivatives of heterocyclic amines. Among these compounds were described sulfanilamide derivatives of the thiazole series, namely 2 - para-nitro - benzenesulfonamido - 4-methylthiazole, 2-N⁴-acetylsulfanilamido-4-methylthiazole, 2-N⁴-acetylsulfanilamidothiazole, 2-sulfanilamido-4-methylthiazole and 2-sulfanilamidothiazole. Similar

compounds have been synthesized by Lott and Bergeim.² Two of these compounds, sulfathiazole (2(para-amino-benzene-sulfonamido) thiazole) and sulfamethylthiazole (2(para-amino-benzene-sulfonamido) 4-methylthiazole) have been distributed for experimental use and clinical investigation. The names have not yet been considered by the Council on Pharmacy and Chemistry.

It has been reported³ that the acute toxicity of sulfathiazole (when administered as the sodium salt by the parenteral route) is definitely less than that of the corresponding sodium salt of sulfapyridine when administered by the same route. The experience with this compound in our division confirms this observation, and we have noted that the sodium salt of the methyl and phenyl derivatives of sulfathiazole are about as acutely toxic for mice as is the sodium salt of sulfapyridine. Hence, from this point of view, it can be definitely said that, in acute toxicity experiments in mice, sulfathiazole is less toxic than its methyl derivative, phenyl derivative and sulfapyridine. Van Dyke and his co-workers⁴ found that the chronic toxicity of sulfathiazole in mice was definitely greater than that of sulfapyridine when these compounds were fed in the diets in concentrations of 2 per cent. Sulfapyridine, however, appeared to be more toxic for growing rats than was sulfathiazole and in monkeys large doses of sulfapyridine produced unilateral or bilateral hydro-ureter and hydronephrosis together with hematuria and albuminuria in six of seven monkeys, while but one in seven monkeys given large doses of sulfathiazole showed like changes. Rake and his associates⁵ noted microscopic lesions in the kidneys, livers and spleens of mice chronically poisoned with sulfathiazole. Similar doses of sulfapyridine produced only hepatic lesions in mice. In rats and monkeys, little evidence of injury was found after intensive sulfathiazole therapy. It would seem from these studies that the chronic toxicity of sulfathiazole for mice is definitely greater than is that of sulfapyridine, while in rats and monkeys sulfapyridine is the more toxic compound. Further studies³ revealed that in mice sulfathiazole disappears from the blood more rapidly than does sulfapyridine, and in rats and monkeys it was noted that sulfathiazole was excreted more rapidly than was sulfapyridine and that the proportion of conjugated sulfathiazole excreted in the urine of these animals was much less than was the case with sulfapyridine. We have noted also that sulfathiazole disappears rapidly from the blood of mice.

The therapeutic effect of these compounds on experimental pneumococcic, meningococcic, hemolytic streptococcic and lymphogranuloma venereum infections in mice has been tested by McKee and her associates.³ It has been shown, as a result of these studies that, when sulfathiazole is administered as 1 per cent of the diet, its therapeutic effects are of the same order of those of sulfapyridine in the control of experimental pneumococcic infections in mice. If 0.5 per cent of the drugs were used in the diets, sulfapyridine was consistently slightly more effective than sulfathiazole. The results obtained in experimental streptococcic, meningococcic and lymphogranuloma venereum infections with sulfathiazole therapy were of the same order

2. Lott, W. A., and Bergeim, F. H.: Communications to the Editor. 2-(p-Aminobenzenesulfonamido)-Thiazole: A New Chemotherapeutic Agent. *J. Am. Chem. Soc.*, December 1932, p. 3593.

3. Van Dyke, H. B., Greep, R. O., Rake, Geoffrey, and McKee, Clara M.: Observations on the Toxicology of Sulfathiazole and Sulfapyridine. *Proc. Soc. Exper. Biol. & Med.* 42: 410 (Nov.) 1932.

4. Rake, Geoffrey; van Dyke, H. B.; Corwin, W. C.; McKee, Clara M., and Greep, R. O.: *J. Bact.* 33: 45 (Jan.) 1940.

5. McKee, Clara M.; Rake, G.; Greep, R. O., and van Dyke, H. B.: Therapeutic Effect of Sulfathiazole and Sulfapyridine. *Proc. Soc. Exper. Biol. & Med.* 42: 417 (Nov.) 1932.

From the Biological Division, Johns Hopkins University School of Medicine.

1. Fosbinder, R. J., and Walter, L. A.: Sulfanilamido Derivatives of Heterocyclic Amines. *J. Am. Chem. Soc.* 61: 2032 (Aug.) 1939.

as were observed when sulfapyridine was used, but, as small numbers of mice were used and practically all of those treated survived, no conclusions as to the effect of the drug can be drawn. Cooper and his co-workers⁶ have reported that sulfathiazole and sulfamethylthiazole are less effective than sulfapyridine in the control of experimental type II pneumococcal and streptococcal infections in mice. Here again too few mice were used to make the reported observations statistically significant. Our own experiments in experimental hemolytic streptococcal and pneumococcal infections in mice lead me to believe that sulfathiazole is somewhat less effective than sulfapyridine as a therapeutic agent when administered in suspension by the peroral route. However, when the drug is administered in a 1 per cent concentration in the diet of the infected mice it seems to be equal to sulfapyridine in its therapeutic efficiency in these infections. In experimental staphylococcal infections in mice sulfathiazole has proved somewhat superior to sulfapyridine. The differences noted in the therapeutic result obtained when the two drugs are administered in suspension by the oral route (as compared with giving it in the food) in experimental infections in mice may be accounted for by the more rapid disappearance of sulfathiazole from the blood of the treated mice.

Recently we have carried out studies on the absorption, distribution and excretion of sulfathiazole in man. These studies indicate that the drug is more readily absorbed from the gastrointestinal tract than is sulfapyridine and that in this respect it approaches sulfanilamide. In the blood the ratio of the free and conjugated fractions of the drug also resembles that of sulfanilamide, differing again in this respect from sulfapyridine. Sulfathiazole is excreted much more rapidly than is sulfapyridine, if renal function is normal. In the urine much less sulfathiazole exists in the acetylated or conjugated form than is the case with sulfapyridine. Sulfathiazole seems to be distributed in exudates and transudates in about the same ratio as has been noted previously for sulfanilamide.

It is too early to pronounce on the comparative clinical therapeutic effects of sulfathiazole and sulfapyridine. However, our experience to date leads us to believe that it is about as effective as sulfapyridine in pneumococcal pneumonia in human beings and at least as effective as sulfapyridine, if not more so, in staphylococcal infections in man.

We have noted in the course of clinical experiments with sulfathiazole that there seemed to be definitely less nausea and vomiting produced by this drug than we should have expected from sulfapyridine. Drug fever and drug rashes have been quite common and, in addition, we have noted three instances of a rather marked congestion of the conjunctivas and scleras in association with an erythematous papular and nodular eruption which was generalized over the extremities and face. The eruption resembled that of erythema nodosum. In one case an injection of the sclera of one eye alone, without an eruption, was observed. These ocular manifestations of sulfathiazole toxicity may be preceded by burning and smarting of the eyes. In at least one case the eruption and conjunctivas seemed to be associated with photosensitization.

Sulfathiazole does not seem to cause a fall in the carbon dioxide combining power of the plasma. Mild

hematuria has been noted in several cases. In one case anuria of forty-eight hours' duration with azotemia but without hypertension or changes in the retina developed shortly after treatment with sulfathiazole had been discontinued. In view of the toxic reactions just described, it is to be expected that sulfathiazole will produce essentially the same clinical toxic manifestations previously described as occurring in the course of treatment with sulfanilamide or sulfapyridine.

Not enough is known as yet to set up standards of dosage. For adult patients ill with pneumococcal pneumonia it has been my custom to prescribe initial doses of 4 Gm. of sulfathiazole, this to be followed at four hour intervals by doses of 1 Gm. of the drug. Using this schedule we have noticed that after the first twenty-four hours of medication the concentrations of sulfathiazole in the blood are frequently much lower than would be expected if sulfapyridine had been administered, and in certain instances it has been difficult to maintain adequate concentrations of the drug in the blood of patients, despite increases in the amount of drug prescribed. This we attribute to the rapid absorption and excretion of the drug. In several cases a relapse of the pneumonia has been noted in association with these low concentrations of sulfathiazole.

There is little available published data concerning the experimental use of sulfamethylthiazole. Herrell and Brown⁷ have stated "It appears that sulfamethylthiazole is a rather efficient drug in infections caused by pneumococcal and especially staphylococcal organisms."

The evaluation of these new chemotherapeutic compounds will necessitate extensive experimental and clinical investigations in order to determine their efficiency in the control of infections and their clinical toxic manifestations. Until the time when such data are in hand, it is to be hoped that enthusiasms do not outrun common sense.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

PREPARATIONS USED IN THE FEEDING OF INFANTS (See Accepted Foods, 1939, p. 156).

Beech-Nut Packing Company, Canajoharie, N. Y.

BEECH-NUT BRAND CHOPPED LIVER AND BEEF SOUP WITH VEGETABLES, BARLEY AND RICE, composition reported by manufacturer to be the same as that of Beech-Nut Brand Strained Liver and Beef Soup with Vegetables, Barley and Rice.

Libby, McNeill & Libby, Chicago.

LIBBY'S BRAND HOMOGENIZED PEAS.

Analysis (submitted by manufacturer).—Moisture 85.4%, total solids 14.6%, ash 1.1%, sodium chloride 0.4%, fat (ether extract) 0.1%, protein (N X 6.25) 3.5%, crude fiber 1.8%, carbohydrate other than crude fiber (by difference) 8.1%, calcium (Ca) 11.0 mg. per 100 Gm., phosphorus (P) 32.8 mg. per 100 Gm., iron (Fe) 2.3 mg. per 100 Gm., copper (Cu) 0.229 mg. per 100 Gm.

Calories.—0.49 per gram; 13.9 per ounce.

Vitamins.—Protocols of biologic assay (1939) show that the product contains 4.0 U. S. P. units of vitamin A per gram, 114 per ounce; 0.34 international units of vitamin B₁ per gram, 9.7 per ounce; 0.20 Sherman-Bourquin units of vitamin G (riboflavin) per gram, 5.7 per ounce; and according to a report of chemical titration (1939) 0.51 international unit of vitamin C per gram, 16.8 per ounce.

7. Herrell, W. E., and Brown, A. E.: The Clinical Use of Sulfamethylthiazol in Infections Caused by *Staphylococcus Aureus*, *Proc. Staff Meet., Mayo Clin.* 14: 753 (Nov. 29) 1939.

6. Cooper, F. B.; Gross, Paul, and Lewis, Marion: Chemotherapeutic Evaluation of Sulfanilamide Derivatives of Heterocyclic Amines, *Proc. Soc. Exper. Biol. & Med.* 42: 421 (Nov.) 1939.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 9, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

DESICCATED BILE

The proper absorption of vitamin K, which takes place only in the presence of an adequate amount of bile in the intestine, is apparently a major factor in the maintenance of a normal level of prothrombin in the blood. Of especial interest in this connection is the suggestion that the clotting deficiency in obstructive jaundice is directly related to improper absorption of vitamin K as the result of lack of necessary biliary constituents in the intestine.¹ This view is in accord with the earlier observation that the hemorrhagic tendency in jaundice may be caused by a diminution of prothrombin.² The therapeutic use of desiccated bile in the treatment of obstructive jaundice has been³ suggested. When the administration of bile to a patient is indicated, the advantages of dried bile over fresh

bile are apparent, since the latter has a tendency to deteriorate and is unpleasant to administer. If desiccated bile is used as a substitute for fresh bile, however, it is important to know whether or not the drying process in any way affects the chemical and physical properties of the product.

A recent report by Johnston and his associates⁴ offers the comparative composition of desiccated and normal hog gallbladder bile. The composition of dried bile, prepared from fresh hog bile by evaporating it to dryness under a high vacuum and at a low temperature, is compared to the chemical makeup of the same bile before dessication. The dry powder prepared from bile dissolves readily in water to yield a solution closely resembling the original bile. Except for some loss of carbon dioxide, the inorganic constituents are not appreciably altered by the process of desiccation. Similarly, the procedure has little effect on the cholesterol, bilirubin, fatty acid, mucin and bile acid content of bile. Moreover, there is little change in the surface tension and viscosity of an aqueous solution of desiccated bile as compared with the physical properties of the original bile. The increase in the free choline, which is accompanied by a decrease in the amount of phospholipid, in the desiccated bile would not have a harmful effect, according to the Detroit investigators.

In general, the data obtained as a result of numerous analyses carried out on bile before and after drying indicate that it is possible to prepare desiccated bile by a mild treatment involving concentration in vacuo at a low temperature without significantly altering its chemical composition. A solution properly prepared from desiccated bile does not differ appreciably from whole bile with respect to its chemical and physical properties.

NATIONAL CONFERENCE ON MEDICAL NOMENCLATURE

On March 1 representatives of specialist societies, hospital organizations, government services and other interested groups met at the headquarters of the American Medical Association in Chicago as the National Conference on Medical Nomenclature. Many problems of classifying disease were considered, both in the form of papers and reports and in discussions. The formal classification of disease involves educational factors, questions of facilitating clinical research, the organization of hospital record libraries, comparative morbidity statistics and morbidity reports and the relation of morbidity to the International List of Causes of Death.

At the conference it was brought out by several of the speakers that eponyms are in general inadvisable as labels for disease. There is, perhaps, a trend toward the use of English rather than Latin terms in classifying disease, but it is, of course, impossible to separate all terms from their Latin or Greek derivatives. The confusion of terms in some branches of medicine, in

1. Dam, H., and Glavind, J.: *Acta med. Scand.* 96: 108, 1938.
Stewart, J. D.: *Ann. Surg.* 109: 388 (April) 1939.
2. Quick, A. J.; Stanley-Brown, Margaret, and Bancroft, F. W.: *Am. J. M. Sc.* 190: 501 (Oct.) 1935.
3. Johnston, C. G.: *Surgery* 3: 875 (June) 1938.

4. Irvin, J. L.; Merker, Harvey; Anderson, C. E., and Johnston, C. G.: *J. Biol. Chem.* 131: 439 (Dec.) 1939.

particular, was emphasized and the inevitable corollary that preferred terms should be chosen, even at the risk of occasional arbitrary decisions. It was also apparent that advance in some fields of medicine necessitates a reexamination of the entire subject of the classification of diseases in those fields.

Several papers and discussions dealt particularly with the methods which can be used in adapting the Standard Classified Nomenclature of Disease to clinical research and to the preparation of reports on the incidence of disease, from single hospitals or groups of hospitals, by the use of punch cards and tabulating methods. The demonstration of the uses to which such a classification can be put emphasizes the deficiencies heretofore existent in most summarizations of morbidity statistics. Indeed, what has been already accomplished may be considered to point the way toward more accurate and more extensive use of tabulating methods in the morbidity field.

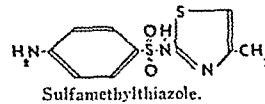
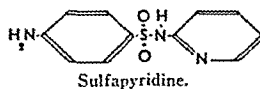
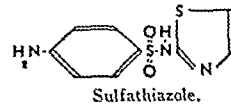
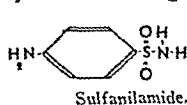
The conference agreed unanimously that a similar conference should meet again in five years and that the Standard Classified Nomenclature of Disease be revised at periods of approximately five years. In the interim, it was suggested that an editorial advisory board be appointed to concern itself with problems which may require more constant supervision than can be attained by the periodic meetings of the National Conference itself. The conference approved the preparation of a standard nomenclature of operations. A complete summarized report of the conference will be published in forthcoming issues of *THE JOURNAL*.

THIAZOLE DERIVATIVES OF SULFANILAMIDE

Since the introduction of sulfanilamide into American therapeutics early in 1937 the Council on Pharmacy and Chemistry has followed new developments carefully. Both *THE JOURNAL* and the Council on Pharmacy and Chemistry have commented repeatedly on the necessity of careful administration of sulfanilamide and its compounds. The tremendous potentialities of the particular chemical grouping represented in the sulfanilamide compounds have warranted the belief that many new paths of therapeutic usefulness would be opened. Progress has been so rapid that the Council has been obliged to issue four succeeding revisions of its statement of actions and uses for the description of the drug in New and Nonofficial Remedies.¹

The introduction of sulfanilamide, as was to be expected, was soon followed by the presentation of a derivative representing a combination of pyridine and sulfanilamide, which received the nonproprietary term sulfapyridine. The Council on Pharmacy and Chemistry has also published recently a revised statement of the actions and uses of sulfapyridine,² necessitated by the additional knowledge beyond that obtainable in May 1939, when the product was accepted.

Now come reports of two more derivatives of sulfanilamide—sulfathiazole and sulfamethylthiazole. Elsewhere in this issue appears a preliminary report of the Council, prepared by Dr. Perrin H. Long,³ on these substances. All of these sulfanilamide derivatives are quite similar in their basic character, as is illustrated by the following graphic formulas:



It is too early to state definitely just what advantages, if any, these derivatives may have over sulfanilamide and sulfapyridine. One group of workers (Herrell and Brown) have stated that sulfamethylthiazole has been found efficient in the treatment of some infections caused by staphylococcus organisms. Further investigation of the effectiveness of the compound in diseases caused by staphylococci is decidedly in order, for if the product is found to be of value in these diseases it certainly will have advantages over sulfanilamide. Again it is fortunate that the product has not been placed on the open market before physicians are given an opportunity to know more about it. In this way, unwise use will be minimized and its true merit can be properly evaluated in those laboratories which have competent facilities for such investigation. As Dr. Long concludes in the preliminary report: "The evaluation of these new chemotherapeutic compounds will necessitate extensive experimental and clinical investigations in order to determine their efficiency in the control of infections and their clinical toxic manifestations. Until the time when such data are in hand, it is to be hoped that enthusiasms do not outrun common sense."

Current Comment

THE DISTINGUISHED SERVICE MEDAL

The Distinguished Service Medal of the American Medical Association will be presented for the third time at the opening general meeting at the annual session of the Association in New York on June 11. This medal was awarded in 1938 to Dr. Rudolph Matas, distinguished surgeon of New Orleans, and last year to Dr. James B. Herrick of Chicago. By the system of selection this award has come to be recognized as one of the most distinguished honors within the gift of the Association. The method of selection of the recipient of the Distinguished Service Medal is specifically defined in the By-Laws of the Association. Any Fel-

¹ Sulfanilamide, *J. A. M. A.* **114**: 326 (Jan. 27) 1940.
² Sulfapyridine, *J. A. M. A.* **114**: 327 (Jan. 27) 1940.

³ Long, P. H.: Thiazole Derivatives of Sulfanilamide, this issue, p. 870.

low of the Association may submit nominations, which should be sent, together with a record of the scientific services of the nominees, to the chairman of the Committee on Distinguished Service Awards or to the Secretary of the Association. Dr. Grant C. Madill, 214 King Street, Ogdensburg, N. Y., is chairman of the Committee on Distinguished Service Awards. Of all nominations received by the committee, five are submitted to the Board of Trustees of the Association, from which the Board selects three to be submitted to the House of Delegates at its first meeting. Immediately on submission of the nominations by the Board of Trustees, the House of Delegates by official vote selects the recipient of the honor, to whom the Distinguished Service Medal is presented on the evening of the following day. Obviously, an extended list of distinguished physicians nominated for this award will enable the Committee on Awards, the Board of Trustees and the House of Delegates, all of whom participate in the selection, to determine for 1940 a recipient of distinction, whose nomination again will reflect favorably not only on himself but also on the Association.

UNITED STATES COURT OF APPEALS REVERSES DECISION OF LOWER COURT

The United States Court of Appeals on March 4 reversed a district court decision by Justice Proctor that medicine was a "learned profession" and therefore not within the scope of the Sherman antitrust act. As part of its decision, the Court of Appeals said "The fact that defendants are physicians and medical organizations is of no significance." At the heart of the litigation is the question whether the law against restraint of trade applies to the medical profession. The court said "We think enough has been said to demonstrate that the common law governing restraint of trade has not been confined, as defendants insist, to the field of commercial activity, ordinarily defined as 'trade,' but embraces as well the field of the medical profession." Again the court said: "It cannot be admitted that the medical profession may through its great medical societies, either by rule or disciplinary proceedings, legally effectuate restraints as far reaching as those now charged." In addition the Court of Appeals held that, while the charge against the American Medical Association may be wholly unwarranted, "For present purposes we must take the charge as though its verity were established; and, in that light, it seems to us clear that the offense is within the condemnation of the statute." The court also said "It certainly cannot be doubted, that Congress intended to exert its full power in the public interest, to set free from unreasonable obstruction the exercise of those rights and privileges which are a part of our constitutional inheritance, and these include immunity from compulsory work at the will of another, the right

to choose an occupation, the right to engage in any lawful calling for which one has the requisite capacity, skill, material or capital, and thereafter free enjoyment of the fruits of one's labors." And, it stated, "Congress undoubtedly legislated on the common law principle that every person has individually, and that the public has collectively, a right to require the course of all legitimate occupations in the District of Columbia to be free from unreasonable obstruction, and likewise in recognition of the fact that all trades, businesses and professions which prevent idleness and exercise men in labor and employment for the benefit of themselves and their families and for the increase of their substance are desirable in the public good and any undue restraint upon them is wrong and is immediate and unreasonable and, therefore, within the purview of the Sherman act." Further, the court said, "we are mindful of a generally known fact that under these rules and standards [of the medical profession] there has developed an *esprit de corps* largely as a result of which the members of the profession contribute a considerable portion of their time to the relief of the unfortunate and the destitute. All of which may well be acknowledged to their credit. Notwithstanding these important considerations, it cannot be admitted that the medical profession may, through its great medical societies, either by rule or disciplinary proceedings, legally effectuate restraints as far reaching as those now charged." Although the attorneys for the American Medical Association have not yet reached a decision as to the next step to be followed, it seems reasonable to believe that they will now go to the United States Supreme Court with a request for a definite decision as to whether or not the practice of medicine comes within the purview of the Sherman antitrust law.

COURT OF APPEALS RULES AGAINST BRINKLEY

Last week the United States Fifth Circuit Court of Appeals at New Orleans upheld a federal district court decision in the libel suit brought by John R. Brinkley against the editor of *Hygeia*. The statement of the court in making this decision was as follows:

We are spared the necessity of discussing the assignments of error in this decision and of reviewing the evidence. It is sufficient to say that the evidence of the plaintiff, placed on the stand by the defendant, tends to show the truth of the statements of fact complained of, and we find no substantial evidence tending to show the defendant was actuated by malice or that plaintiff suffered any actual damage compensable in money.

In the presentation of its case before the federal district court the American Medical Association revealed a long trail of dubious medical activities on the part of Dr. John R. Brinkley for which there was no refutation. In the meantime he continues to broadcast from his station across the Rio Grande, and the United States Post Office continues to permit him the use of the United States mails.

ORGANIZATION SECTION

LEGISLATION OF INTEREST TO PHYSICIANS CONSIDERED BY STATE LEGISLATURES IN 1939

PREPARED BY T. V. McDAVITT OF THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

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During 1939 the legislatures of all the states, except Kentucky, Louisiana, Mississippi and Virginia, met in regular session, and special sessions were also held in five of them. More than 63,000 proposals were considered, of which not less than 4,000 were of definite medical interest. This survey, however, must be limited to reporting as briefly as possible what are deemed to be the more significant of those proposals—significant from the standpoint of public health and the medical profession. To expedite perusal for those more interested in ascertaining what the legislatures have perpetrated in the name of legislation than what could have been or may in the future be, enactments are printed in larger (10 point) type, while proposals failing of enactment and footnotes are printed in the usual type of the survey (8 point and 6 point).

I. STATE MEDICINE: COMPULSORY AND VOLUNTARY MEDICAL, DENTAL AND HOSPITAL SERVICE PLANS

COMPULSORY HEALTH INSURANCE.—Bills similar to, if not identical with, "The Social Security Bill for Health Insurance," prepared by the American Association for Social Security, failed of enactment in California,¹ Connecticut,² Massachusetts,³ New York,⁴ Pennsylvania,⁵ Rhode Island⁶ and Wisconsin.⁷ These bills proposed a system of compulsory and voluntary sickness insurance, the benefits of which were to consist of cash in all forms of medical, dental and hospital service. In most of them, persons employed at "other than manual labor" and receiving wages in excess of \$60 a week, farm laborers and per-

sons employed by an employer having less than three employees in personal or domestic services were to be excluded from the compulsory insurance of the bill but were to be entitled to participate in the voluntary insurance. All other employees were embraced in the compulsory feature of these bills.

The life of the committee authorized by New York Laws, 1938, c. 682, to investigate the health requirements of the people and to recommend such health insurance proposals with respect to state medicine as it deems advisable was extended to March 15, 1940, by a New York law.⁸

Bills were killed in Connecticut⁹ and Ohio¹⁰ to create commissions to study the subject of health insurance, with a view to establishing systems of health insurance for the states and to report to the legislature recommendations for appropriate legislation.

VOLUNTARY MEDICAL SERVICE PLANS.—Laws were enacted in Connecticut,¹¹ Michigan,¹² New York,¹³ Pennsylvania¹⁴ and Vermont¹⁵ permitting nonprofit corporations which are authorized by a designated state agency to do so to operate on a prepayment basis nonprofit medical service plans whereby stated medical services and care may be rendered at the expense of the corporations to subscribers to such plans and their dependents. Generally speaking, these plans contemplate that the subscriber shall have available the services of a physician of his own choice and that the corporation itself will pay the bills incurred to the phy-

8. N. Y., Laws, 1939, c.—, approved June 9, introduced as A. 2082, Conn. H. 1495.
9. Ohio H. 171.
10. Conn., Laws, 1939, c. 338.
11. Mich., Acts, 1939, Public Act No. 108 (a companion bill, H. 386, failed of enactment).
12. N. Y., Laws, 1939, c. 882 (the following similar bills were killed: A. 569, A. 1923, A. 1982, S. 1719).
13. Pa., Acts 1939, Act No. 398 and 399.
14. Vt., Laws, 1939, c.—, approved April 14, introduced as S. 69.

1. Calif. S. 1128, S. 551.
2. Conn. H. 1451.
3. Mass. H. 1898.
4. N. Y. A. 2252, A. 2241.
5. Pa. H. 671.
6. R. I. H. 809.
7. Wis. A. 897.

sicians chosen by the subscribers. The New York act, however, seems to contemplate that the subscriber will be reimbursed by the corporation for the amount he has expended for such services.

The Vermont law specifically permits the formation of corporations for the rendering of dental, osteopathic, chiropractic or chiropodic care.

Bills proposing to authorize the operation of medical service plans were killed in California,¹⁶ Illinois,¹⁷ Ohio,¹⁸ Utah,¹⁹ Washington²⁰ and Wisconsin.²¹ Bills were killed in Michigan²² and Pennsylvania²³ proposing to authorize the operation of similar plans for osteopathic care.

One Washington bill,²⁴ which was killed, proposed to authorize employers to contract for the providing of medical, nursing and hospital care to employees on an insurance basis. Another unsuccessful Washington bill²⁵ proposed to create a commission to investigate medical service bureaus.

Laws were enacted in two states which would seem to permit designated groups to provide for their members what may well be medical and hospital service plans. The Missouri Insurance Code was so amended²⁶ as to permit fraternal benefit societies to operate for the benefit of its sick members and their dependents plans whereby medical and hospital services may be rendered free or at a rate determined on.

A new Arkansas law²⁷ authorizes agricultural cooperatives, among other things, "to engage in any activity in connection with . . . the furnishing of medical, dental, health, hospitalization, nursing, or any related services, or medicines or medical supplies to its members and/or their families."

VOLUNTARY HOSPITAL SERVICE PLANS.—Laws were enacted in Alabama,²⁸ Connecticut,²⁹ Florida,³⁰ Iowa,³¹ Maine,³² Michigan,³³ New Hampshire,³⁴ New Mexico,³⁵ Ohio,³⁶ Rhode Island,³⁷ South Carolina,³⁸ Texas,³⁹ Vermont⁴⁰ and Wisconsin⁴¹ authorizing the formation of nonprofit corporations to provide on a prepayment basis hospital care to their members or subscribers.

Similar bills were killed in nine states.⁴²

Unsuccessful attempts were made in two states⁴³ apparently to legalize the activities of organizations now operating hospital service plans.

A resolution was adopted in Maryland⁴⁴ requesting the governor to appoint a commission to study the question of compulsory hospital insurance.

As previously noted, the legislature of Washington rejected two bills on this subject. One bill⁴⁵ proposed to authorize

employers to contract for the providing of employees with medical treatment, nursing and hospital care on an insurance basis. The other bill⁴⁶ proposed to create a commission to investigate hospital associations and medical service bureaus.

The prior California nonprofit hospital service plan law was amended this year.⁴⁷ Of particular interest is the new definition of "hospital services," which is stated to include "maintenance and care in hospital, nursing care, drugs, medicine, physiotherapy, transportation, material appliances and their upkeep, and indemnification of the beneficiary or subscriber for the costs and expense of professional medical service rendered during hospitalization."

The Massachusetts nonprofit hospital service plan law was so amended,⁴⁸ among other things, as to provide that the contracts issued and the rates charged by a hospital service plan corporation shall at all times be subject to the approval of the Commissioner of Insurance.

FREE CARE OF THE INDIGENT SICK OR THE GENERAL PUBLIC.—A new Michigan law⁴⁹ requires the several counties to provide for the rendering of medical care to indigents. Medical care is to include home and office attendance by licensed physicians, dental services, optometric services, bedside nursing services in the home and pharmaceutical service. The law specifically provides that the private physician-patient relationship must be maintained provided only that nothing in the law is to be construed as affecting the office of any city physician established under any city charter or of any county health officers or of the medical superintendent of any county hospital.

A far reaching bill to establish a statewide plan of public medicine was killed in New York.⁵⁰ Apparently all kinds of medical, surgical, dental, hospital and nursing care were to be rendered to the public at large without cost. All licensed practitioners of medicine, dentistry, pharmacy and nursing who elected to accept and submit to the provisions of the bill were to receive an annual compensation from the state of up to \$6,000. The state department of health was to have exclusive charge and control over the public hospitals of the state and was to exercise complete supervisory powers over all private hospitals.

A bill was killed in California⁵¹ to provide a system, under the supervision of the state department of public health for providing medical care, including medical, dental, nursing and hospital care and the supplying of pharmaceutical and therapeutic appliances to needy persons, the cost of which was to be apportioned between the state and the county.

A new Indiana law⁵² provides that any legal resident of the state over 16 suffering from a condition or malady, not chronic, or deformity that is susceptible of improvement, cure or benefit by medical or surgical treatment or hospital care or by special study and diagnosis may be admitted on the commitment of any judge to any hospital operated by the trustees of Indiana University and treated therein. The cost of the cure and treatment of the person committed is to be paid by the county from which the person is committed.

Bills were adopted in four states authorizing specified counties to levy taxes to be used for the medical and hospital treatment of the indigent sick.⁵³

16. Calif. A. 2494, A. 2501, A. 1712, S. 548.

17. Ill. H. 977.

18. Ohio S. 104.

19. Utah S. 177, H. 225.

20. Wash. H. 209.

21. Wis. A. 401.

22. Mich. H. 386.

23. Pa. H. 1098, H. 934.

24. Wash. H. 199.

25. Wash. S. 311.

26. Mo., Laws, 1939, c.—, approved July 8, introduced as S. 286.

27. Ark., Acts, 1939, Act. 153.

28. Ala., Laws, 1939, Gov. No. 491.

29. Conn., Laws, 1939, c. 150.

30. Fla., Laws, 1939, c. 19108.

31. Iowa, Laws, 1939, c. 222.

32. Me., Public Laws, 1939, c. 149; Public and Special Laws, 1939,

c. 24.

33. Mich., Acts, 1939, Public Act No. 109.

34. N. H., Laws, 1939, c.—, approved April 13, introduced as H. 232.

35. N. M., Laws, 1939, c. 65, c. 66.

36. Ohio, Laws, 1939, c.—, approved April 12, introduced as S. 181.

37. R. I., Laws, 1939, c. 719.

38. S. C., Laws, 1939, Gov. No. 660.

39. Texas, Laws, 1939, c.—, approved, May 10, introduced as H. 191

(a companion bill, S. 127, was killed).

40. Vt., Laws, 1939, c.—, approved April 10, introduced as H. 68.

41. Wis., Laws, 1939, c. 118 (a companion bill, A. 519, was killed).

42. Fla. S. 149, H. 74; Ind. H. 241; Minn. H. 1367, S. 1248; Neb.

Bill 507; Tenn. H. 997; Texas S. 127; Utah S. 177; Wash. S. 131;

W. Va. S. 107.

43. Ark. S. 304; N. M. H. 58.

46. Wash. S. 311.

47. Calif., Laws, 1939, c. 112, c. 523.

48. Laws, Mass., 1939, c. 312.

49. Mich., Laws, 1939, Public Act No. 280.

50. N. Y. A. 523.

51. Calif. A. 1874.

52. Ind., Laws, 1939, c. 6.

53. Del., Laws, 1939, c.—, approved May 4, introduced as S. 277; Fla., Laws, 1939, c.—, approved June 5, introduced as S. 111, c.—, approved May 17, introduced as H. 769; N. C., Public Local Laws, 1939, c. 149.

A new Georgia law⁵⁴ authorizes counties to levy a 1 mill tax to provide medical care and hospitalization for indigent sick residents.

A new Texas law⁵⁵ authorizes each county to levy a tax not to exceed 10c on the hundred dollar valuation on taxable property to buy necessary vaccines and to pay for the necessary medical services required for the immunization of school children and indigents from communicable diseases and to pay as much as one half for medical treatment and hospitalization of people not paupers.

Another Texas bill, which failed of enactment,⁵⁶ proposed to create a state department of hospitalization and medical care to provide for the hospitalization and treatment of the indigent sick and indigent expectant mothers.

An unsuccessful attempt was made in New Mexico⁵⁷ to authorize the board of county commissioners of each county to employ a county health physician and a county health nurse. Two Oklahoma bills,⁵⁸ which were killed, proposed to authorize the state commissioner of health to appoint one regularly licensed physician for each county in the state to give medical treatment free of charge to such persons as would make affidavit that they were unable to pay for treatment.

Unsuccessful attempts were made in Connecticut⁵⁹ and Illinois⁶⁰ to provide for the rendering of medical services at state expense to recipients of old age assistance. An unsuccessful Washington bill⁶¹ provided somewhat similar services with respect to recipients of blind assistance.

Laws were enacted in Connecticut,⁶² Illinois⁶³ Indiana⁶⁴ and New Jersey,⁶⁵ appropriating stated sums to the state board or department of health for the purchase and free distribution of pneumococcus serum for the treatment of persons afflicted with pneumonia and financially unable to purchase the serum. No specific appropriation was made in the Connecticut law, while the appropriation in Illinois was \$75,000, \$95,000 in Indiana and \$25,000 in New Jersey. The Indiana laws authorize the distribution also of diphtheria toxoid, smallpox virus and typhoid bacterins.

A new Florida law⁶⁶ appropriates \$10,000 to the state board of health with which it is to purchase and distribute insulin to persons needing it and financially unable to purchase it.

A somewhat similar bill was killed in Wisconsin.⁶⁷

A new Connecticut law⁶⁸ authorizes the state department of health to furnish such treatment to indigent typhoid or paratyphoid fever germ carriers as may be necessary to relieve them of the carrier state.

An unsuccessful Pennsylvania bill⁶⁹ proposed to authorize the department of welfare to supply hearing aids or devices to persons who are deaf or hard of hearing and who are financially unable to purchase them.

Two New York bills, which were killed,⁷⁰ proposed to require local boards of health and local health officers to provide to persons infected with poliomyelitis suitable surgical, medical or therapeutic treatment or hospital care and necessary appliances and devices provided the person so infected was not able financially to provide for himself. Two other unsuccessful New

York bills⁷¹ proposed to impose on counties or other political subdivisions the duty of supplying such "physical repair" to physically handicapped unemployed adult persons and to require the state to reimburse the local political subdivisions 75 per cent of the total expended by them for such purpose. Two other New York bills, which likewise failed of enactment⁷² proposed to create a temporary commission to survey the existence and prevalence of hay fever in the state, to devise ways and means for its prevention and elimination and to recommend methods for the treatment, relief and cure of persons suffering from hay fever.

Legislation relating to cancer control and the extent of aid rendered at public expense to afflicted persons will be subsequently discussed in this survey at p. 879.

II. LEGISLATION AIMED AT THE CONTROL OF VENEREAL DIS- EASE, DIPHTHERIA, CANCER AND OTHER DISEASES

PREMARITAL EXAMINATIONS.—Laws to require as a condition precedent to the issuance of a marriage license that each party to the proposed marriage present a certificate of a licensed physician that the party has been given such examination, including a standard serologic test, as may be necessary for the discovery of syphilis, made on a day specified in the statement, which shall be not more than thirty days prior to the day on which the license is applied for, and that in the opinion of the physician the party named is not infected with syphilis or, if so affected, is not in a stage of that disease whereby it is communicable, were enacted in California,⁷³ Colorado,⁷⁴ Indiana,⁷⁵ North Carolina,⁷⁶ North Dakota,⁷⁷ Pennsylvania,⁷⁸ South Dakota,⁷⁹ Tennessee⁸⁰ and West Virginia.⁸¹ In addition, the North Carolina and Tennessee laws require a similar statement with respect to all venereal diseases.

Proposals to condition the issuance of a license to marry on the presentation by both parties to the proposed marriage of a physician's certificate as to freedom from an infectious stage of a stated venereal disease were rejected in sixteen other states.⁸²

Existing laws requiring premarital examinations were amended in Illinois,⁸³ Michigan⁸⁴ and New York.⁸⁵ The principal change effected by the new Illinois law is to provide that the laboratory tests for venereal diseases prescribed in the act must be tests approved by the state department of public health and must be made by laboratories of that department or by such other laboratories as the department approves. The new Michigan law raises to thirty days from fifteen days the period prior to the issuance of a license to marry during which the applicants must have been examined for the presence of the stated venereal diseases. The law also requires freedom on the part of

54. Ga. Laws, 1939, Gov. Act. No. 56.

55. Texas Laws, 1939, c. —, Law without Approval June 13, introduced as H. 927.

56. Texas H. 144.

57. N. M. H. 31.

58. Okla. H. 76, S. 17.

59. Conn. S. 875.

60. Ill. S. 9.

61. Wash. S. 187.

62. Conn. Laws, 1939, c. —, approved June 19, introduced as H. 1679.

63. Ill. Laws, 1939, p. —, approved March 22, introduced as H. 408.

64. Ind. Laws, 1939, c. 5, c. 33.

65. N. J. Laws, 1939, c. 13.

66. Fla. Laws, 1939, c. 19553.

67. Wis. A. 823.

68. Conn. Laws, 1939, c. 285.

69. Pa. H. 756.

70. N. Y. S. 130, A. 175.

71. N. Y. A. 2251, S. 1786.

72. N. Y. S. 1776, A. 2243.

73. Calif. Laws, 1939, c. 382 (A. 32, A. 106, A. 342, A. 714 and S. 79, all of which were similar bills, were also considered in California but were not acted on).

74. Colo. Laws, 1939, c. 128.

75. Ind. Laws, 1939, c. 100.

76. N. C. Laws, 1939, c. 314.

77. N. D. Laws, 1939, c. 162.

78. Pa. Acts, 1939, Act. No. 76 (similar bills, S. 13 and S. 129, were vetoed earlier in the session by the governor).

79. S. D. Laws, 1939, c. 36.

80. Tenn. Public Acts, 1939, c. 122 (a companion bill, S. 256).

81. W. Va. Laws, 1939, c. 81 (a companion bill, S. 83).

82. Ala. H. 161; Ark. H. 58; H. 252, S. 143; Ariz. H. 3; Fla. H. 527; Ga. S. 42, H. 222; Idaho H. 253; Iowa S. 27, H. 59; Me. H. 1195; Mass. H. 74, H. 287, H. 551, H. 1828, H. 2381; Mo. H. 39, S. 5, H. 717; Nev. A. 165; Ohio H. 268, H. 379, S. 28; Okla. H. 131; Texas H. 61, H. 1093; Va. H. 35, H. 319; Wash. S. 373.

83. Ill. Laws, 1939, p. 706.

84. Mich. Acts, 1939, Public Act No. 112.

85. New York Laws, 1939, c. 110.

the applicants from an infectious stage of syphilis, gonorrhea or chancroid, while the prior law required freedom from all venereal diseases. Laboratories which can make the indicated tests must be approved by the state commissioner of health. The test required in the new law for syphilis is "a serological test approved by the commissioner." The prior law required a Kahn test. The new New York law effects several minor changes in the prior law. Possibly the most important change effected is to provide that the examination conducted by the certifying physician must be made not earlier than thirty days prior to the date on which the license is applied for. The prior law contained a twenty day period.

Bills to amend existing premarital examination laws were killed in Oregon⁸⁶ and Wisconsin.⁸⁷ Both of these bills proposed certain state facilities to render the required laboratory examinations free of cost.

BLOOD TESTS OF PREGNANT WOMEN.—Laws to require a licensed physician or other person engaged in the antepartum care of a pregnant woman, or attending such a woman at the time of delivery, to obtain a specimen of her blood and to submit the specimen to an approved laboratory for a standard laboratory test for syphilis were enacted in California,⁸⁸ Colorado,⁸⁹ Delaware,⁹⁰ Illinois,⁹¹ Indiana,⁹² Iowa,⁹³ Maine,⁹⁴ Massachusetts,⁹⁵ Michigan,⁹⁶ North Carolina,⁹⁷ Oklahoma,⁹⁸ Pennsylvania,⁹⁹ South Dakota¹⁰⁰ and Washington.¹⁰¹

Similar bills were killed in six other states.¹⁰²

REPORTING OF VENEREAL DISEASE.—A new Alabama law¹⁰³ requires a physician diagnosing or treating a case of syphilis, gonorrhea, chancroid, venereal lymphogranuloma or granuloma venereum to report the facts immediately to the county health officer. The law requires a similar report from the superintendent or manager of a hospital, dispensary or penal or other institution in which there is a case of venereal disease.

A similar bill failed of enactment in New Jersey.¹⁰⁴

COMPULSORY TREATMENT OF VENEREAL DISEASE.—A new Alabama law¹⁰⁵ authorizes the county health officer to require all persons infected with a venereal disease to undergo treatment by a licensed physician and if such persons are unable to pay for such treatment the health officer may require them to submit to treatment at public expense. The law also authorizes the county health officer to isolate or quarantine persons infected with venereal disease and to commit to jail for treatment persons refusing to take or continue treatments as provided in the act.

86. Ore. S. 30.

87. Wis. S. 251.

88. Calif., Laws, 1939, c. 127 (similar bills considered by the California legislature were S. 80, S. 130, and A. 831).

89. Colo., Laws, 1939, c. 113 (S. 330 and S. 331 were similar bills which were not acted on by the Colorado Senate).

90. Del., Laws, 1939, c.—, approved March 8, introduced as S. 27.

91. Ill., Laws, p. 708.

92. Ind., Laws, 1939, c. 12.

93. Iowa, Laws, 1939, c. 82.

94. Me., Public Laws, 1939, c. 290.

95. Mass., Laws, 1939, c. 407 (a similar bill, H. 1827, was also before the Massachusetts legislature).

96. Mich., Acts, 1939, Public Act. No. 106 (a similar bill, H. 140, was also considered).

97. N. C., Laws, 1939, c. 313.

98. Okla., Laws, 1939, c.—, approved March 10, introduced as S. 92.

99. Pa., Acts, 1939, Act. No. 360 (a similar bill, S. 12 was vetoed earlier in the session by the governor).

100. S. D., Laws, 1939, c. 103.

101. Wash., Laws, 1939, c. 163.

102. Ariz. H. 209; Conn. H. 294; Md. H. 103; Nev. A. 192; N. M. H. 282; Tenn. H. 1039.

103. Ala., Laws, 1939, Gov. No. 229.

104. N. J. S. 171.

105. Ala., Laws, 1939, Gov. No. 366.

FREE TREATMENT FOR INFECTED INDIGENTS.—A new Florida law¹⁰⁶ authorizes counties of from 53,000 to 57,000 population to provide medical treatment at county expense to all indigent residents suffering from venereal disease.

STATE FACILITIES FOR THE DIAGNOSIS OF VENEREAL DISEASE.—A new Oregon law¹⁰⁷ amends the prior law directing the state board of health to provide free of charge facilities for the necessary laboratory examinations for the diagnosis of venereal disease and to provide the necessary materials for the proper treatment of those diseases to persons whom the attending physician certifies are unable to pay therefor by requiring as a condition precedent to the rendition of the services and the supplying of the materials noted to the attending physician that the attending physician certify that he will make no charge to the patient for the treatment of the diseases for which the test is made.

DISTRIBUTION OF ANTISYPHILITIC DRUGS.—Bills were killed in Florida¹⁰⁸ and Utah¹⁰⁹ to provide for the distribution at state expense of stated antisyphilitic drugs to persons afflicted with syphilis who are financially unable to purchase them.

BLOOD TESTS OF PHYSICIANS, DENTISTS AND NURSES.—A bill was killed in Indiana¹¹⁰ which proposed to require every physician, dentist and nurse at least once every twenty-four months to cause to be submitted to an approved laboratory for a standard serologic test for syphilis a sample of his blood. If any such test should show that a physician, dentist or nurse was infected with syphilis the license of such person should be automatically suspended and remain suspended so long as the disease was in a stage whereby it was communicable.

SPECIFIC APPROPRIATIONS FOR THE ERADICATION OF VENEREAL DISEASE.—A new Colorado law¹¹¹ appropriates \$12,000 to the state board of health for the period ending June 30, 1941, to be used for "venereal disease control work."

A bill was killed in Texas¹¹² which proposed to appropriate \$150,000 to the state department of health to assist in the eradication of venereal disease in the state.

PHYSICAL EXAMINATION OF FOOD HANDLERS OR DOMESTIC SERVANTS.—A new Texas law¹¹³ prohibits the employment in any public eating or sleeping place or place where food, drink or candy is prepared, stored, packed or served of any person with an infectious or contagious disease. Any person so employed must present every six months a physician's certificate that he has examined the employee and has found him free from all infectious or contagious diseases.

Similar bills were killed in five states.¹¹⁴

The Governor of New York vetoed a bill¹¹⁵ proposing to prohibit a person with a communicable or contagious disease from working or being permitted to work in a factory wherein a food product is manufactured and to require any employee of such a factory when required by a medical inspector of the labor department to submit to a physical examination.

A bill was killed in New York¹¹⁶ to prohibit the employment as a domestic servant of any person who does not possess a physician's certificate as to freedom from syphilis and to require such servants to submit to an examination to determine that fact annually.

106. Fla., Laws, 1939, c.—, approved June 5, introduced as S. 107.

107. Ore., Laws, 1939, c. 301.

108. Fla. H. 174.

109. Utah S. 239.

110. Ind. H. 494.

111. Colo., Laws, 1939, c.—, approved May 24, introduced as H. 222.

112. Texas S. 101.

113. Texas, Laws, 1939, c.—, approved April 26, introduced as H. 115.

114. Ill. H. 230; Iowa H. 30; N. Y. A. 302; Ohio H. 176; Tenn. H. 1038.

115. N. Y. A. 1303.

116. N. Y. A. 2242.

IMMUNIZATION TO DIPHTHERIA.—A law was enacted in North Carolina¹¹⁷ requiring the parents or guardian of any child in the state to have administered to the child between the ages of 6 and 12 months an immunizing dose of a prophylactic diphtheria agent approved by the United States Public Health Service. A similar duty rests on parents and guardians of children between 1 and 5 years of age who have not been immunized previously against diphtheria. If the parents or guardians are financially unable to pay a physician of their own choice to perform the required immunization, the appropriate county health officer is to administer such treatment free of charge.

A new New Jersey law¹¹⁸ authorizes any board of education to condition school attendance on proof of immunity to diphtheria. Such board may provide free of cost materials and services for the required immunization.

CANCER.—Laws aimed to aid in the eradication of cancer were enacted in four states. In Illinois new laws¹¹⁹ create in the department of health a division of cancer control and an advisory board to that division which is authorized to receive voluntary contributions from any source and to expend them for cancer control. An appropriation of \$25,400 was also made to enable the department of health to establish a cancer diagnostic service. In Wisconsin¹²⁰ provision was made for the annual appropriation of \$10,000 for research into the causes, prevention and cure of cancer. A new South Carolina law¹²¹ authorizes the state board of health to establish a standard for the conduct of cancer units in general hospitals, to provide financial aid to indigent cancer patients in such approved cancer units and to establish such facilities as it deems advisable to afford proper treatment and care. The board is also directed to carry on a proper educational program to prevent cancer, to aid in the early diagnosis of the disease and to inform hospitals and cancer victims concerning proper treatment. In Vermont¹²² a state cancer commission was created to be composed of the chairman of the cancer committee of the state medical society, two other members of the society and a layman. The commission is to establish and conduct cancer clinics throughout the state, which clinics are to furnish care to indigent cancer victims. The commission may grant state aid for care in any place in the state to afflicted persons who are not wholly indigent but are without means of providing adequate care for themselves. The names of persons receiving such aid may not be made public. An appropriation of \$10,000 was made to the commission for each of the next two years.

EXAMINATION OF PUBLIC SCHOOL PUPILS AND EMPLOYEES.—A new New Jersey law¹²³ requires every board of education periodically to determine or cause to be determined the presence or absence of communicable tuberculosis in pupils in schools under its jurisdiction. The state board of education is directed to promulgate rules and regulations with respect to the frequency and procedure of such examinations. Any pupil found to have tuberculosis in a communicable stage must be excluded from the school and can be

readmitted only when satisfactory evidence is adduced that he or she is free from communicable tuberculosis, is physically competent to engage in school activities and is not a menace to the health of other pupils. Another new New Jersey law¹²⁴ provides that in conducting the examinations of pupils required by law, the medical inspector may require pupils to loosen, open, or remove their clothing above the waist in a manner to facilitate inspection and examination, provided the parents or guardian are notified in writing of such proposed examination and the examination is conducted either in the presence of one of the parents or guardian or in the presence of a nurse or teacher. If the parent or guardian of a pupil objects to a proposed examination then the parent or guardian may file with the medical inspector a report of the family physician on the condition for which such examination was deemed advisable by the medical inspector. Still another new New Jersey law¹²⁵ authorizes every board of education to require a physical examination of all employees of the board at least once in three years, under such rules and regulations as the state board of education may promulgate. If the result of the examination indicates mental abnormality or a communicable disease, the employee is to be ineligible for further service until satisfactory proof of recovery is furnished.

Unsuccessful attempts were made in three states¹²⁶ to require all public school teachers to undergo annually a physical examination and to submit to blood tests to determine the presence or nonpresence of tuberculosis and venereal disease.

BUREAUS OR DIVISIONS OF INDUSTRIAL HYGIENE.—Idaho¹²⁷ and Montana¹²⁸ enacted laws this year establishing a bureau or division of industrial hygiene respectively in the department of public welfare and in the state board of health primarily to make studies of industrial hygiene, industrial health hazards and occupational disease problems in the state and to establish rules and regulations for the control and prevention of sickness in industry.

III. LEGISLATION REGULATING THE DISTRIBUTION OR POSSESSION OF DRUGS, FOODS, COSMETICS AND THERAPEUTIC DEVICES

NARCOTICS.—Unsuccessful attempts were made in five states¹²⁹ to repeal existing laws regulating the possession and distribution of narcotic drugs and to enact what appeared to be the uniform narcotic drug act. An unsuccessful attempt was made in Michigan¹³⁰ to repeal the uniform narcotic drug act enacted in 1937.

The uniform narcotic drug acts of Connecticut, Illinois, Indiana, Michigan, New Mexico, New York, Oregon, Rhode Island, Tennessee and West Virginia were so amended this year as either to redefine cannabis, which had previously been included in the act, or to redefine "narcotic drug" so as to include cannabis and to define the term "cannabis" substantially as follows:

"'Cannabis' shall include all parts of the plant *Cannabis sativa* L., whether growing or not; the seeds thereof; the resin

117. N. C. Public Laws, 1939, c. 126.

118. N. J. Laws, 1939, c. 299.

119. Ill. Laws, 1939, p. 189, p. 1136, p. 1145.

120. Wis. Laws, 1939, c. 408.

121. S. C. Laws, 1939, Gov. No. 661.

122. Vt. Laws, 1939, c. —, approved March 28, introduced as H. 56.

123. N. J. Laws, 1939, c. 294.

124. N. J. Laws, 1939, c. 296.

125. N. J. Laws, 1939, c. 295.

126. Calif. S. 696; Ind. S. 93; Tenn. H. 1054.

127. Idaho Laws, 1939, c. 136.

128. Mont. Laws, 1939, c. 127.

129. Kan. H. 330; Me. S. 416; N. H. H. 291; N. D. S. 155, H. 350; Wash. H. 261.

130. Mich. S. 59.

extracted from any part of such plant; and every compound, manufacture, salt, derivative, mixture or preparation of such plant, its seeds, or resin; but shall not include the mature stalks of such plant, fiber produced from such stalks, oil or cake made from the seeds of such plant, any other compound, manufacture, salt, derivative, mixture or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil or cake, or the sterilized seed of such plant which is incapable of germination."¹³¹

Similar bills were killed in three states.¹³²

An unsuccessful attempt was made in Illinois¹³³ so to amend the uniform narcotic drug act as to increase the penalty that can be imposed for a violation thereof. Likewise, an unsuccessful attempt was made in Michigan¹³⁴ so to amend the uniform narcotic drug act as to provide that a physician may cause narcotic drugs to be administered by a nurse or intern under his direction. The present law provides that the physician may cause such drugs to be administered by a nurse or intern under his direction and supervision. A bill was killed in Texas¹³⁵ to amend the uniform narcotic drug act in force therein in several particulars.

The narcotic drug act in force in California was amended¹³⁶ by adding provisions authorizing the imprisonment of narcotic addicts as defined by the law. Another California amendment¹³⁷ contains details concerning prescriptions.

The governor of New Jersey vetoed a bill¹³⁸ proposing to authorize a judge of the court of common pleas, after notice and hearing, to commit a narcotic addict to any state, county or city institution for the care and treatment of his addiction.

Laws, other than narcotic drug acts, relating to marihuana were amended or supplemented in five states this year. A new Maine law¹³⁹ makes the prior law, which applied to the sale or distribution of cannabis applicable also to "any derivative of cannabis indica or cannabis sativa, either dried or in any cigarettes, tobacco, either smoking or chewing, or snuffing articles, or in any other form whatsoever." A new North Dakota law¹⁴⁰ amends the prior law relating to marihuana by defining marihuana to mean "all parts of the plant Cannabis sativa, and also known as American Hemp and Indian Hemp," and makes it unlawful for any person to grow, sell, trade, furnish, give away or to possess marihuana. The new law also makes it the duty of each sheriff to destroy all marihuana found growing on public highways or state or county lands. New Indiana and New Jersey laws¹⁴¹ require stated public officials to destroy marihuana weeds. A new Minnesota law¹⁴² permits Indian hemp to be grown for commercial purposes under license of the Commissioner of Agriculture.

An unsuccessful attempt was made in Montana¹⁴³ to amend the law prohibiting the distribution or possession of peyote (pellote), and anhalonium or any preparation thereof, so as to provide that the act should not apply to transporting, possessing or using peyote for religious sacramental purposes within the boundaries of an Indian reservation.

131. Conn., Laws, 1939, c. 201; Ill., Laws, 1939, p. 498 (H. 111 and S. 32, to accomplish the same purpose, failed of enactment); Ind., Laws, 1939, c. 8 (S. 136, a companion bill, was killed); Mich., Acts, 1939, Public Act No. 263; N. M., Laws, 1939, c. 96; N. Y., Laws, 1939, c. 131; Ore., Laws, 1939, c. 168; R. I., Laws, 1939, c. 712; Tenn. Pub. Acts, 1939, c. 165; W. Va., Laws, 1939, c. 44.
132. Fla. S. 967; N. Y. S. 1195; Ohio H. 373.
133. Ill. S. 42.
134. Mich., S. 318.
135. Tex. H. 22.
136. Calif., Laws, 1939, c. 1079.
137. Calif., Laws, 1939, c. 1097.
138. N. J. A. 200.
139. Me., Laws, 1939, c. 187.
140. N. D., Laws, 1939, c. 137.
141. Ind., Laws, 1939, c. 120; N. J., Laws, 1939, c.—, approved July 18, introduced as S. 214.
142. Minn., Laws, 1939, c. 405.
143. Mont. S. 83.

BARBITURIC ACID DERIVATIVES.—Laws prohibiting the sale or distribution of stated hypnotic or somnifacient drugs, except on the prescription of a licensed physician, dentist or veterinarian, were enacted in Connecticut,¹⁴⁴ Delaware,¹⁴⁵ Florida,¹⁴⁶ Georgia,¹⁴⁷ Minnesota,¹⁴⁸ Nevada,¹⁴⁹ New York,¹⁵⁰ North Carolina,¹⁵¹ South Carolina,¹⁵² Tennessee,¹⁵³ Vermont¹⁵⁴ and Washington.¹⁵⁵ All the laws referred to apply to the sale or distribution of barbital. The Delaware and New York laws also apply to the sale at retail of sulfonethylmethane (trional), sulfonmethane (sulfonal), diethyl-sulfone, diethyl-methane (tetronal), paraldehyde, chloral or chloral hydrate and chlorbutanol. The Georgia law also applies to amytal, veronal, luminal or any similar drugs. The Minnesota and Vermont laws apply also to veronal, propional, ipral, dial, neonal, sandoptal, amytal, phenobarbital, phandorn, noctal, allonal or medinal. The Washington law also applies to amytal, luminal, veronal, acid diethylbarbituric, para-amino-benzene sulfonamide, sulfanilamide, sulfamidyl, prontylin, prontosil, neoprontosil, neoprontylin, edimalin, sulfonamid or any salts, derivatives or compounds of any of the drugs mentioned.

Similar bills to restrict the sale or distribution of barbituric acid compounds to distribution on the written prescription of a licensed physician, dentist, or veterinarian were killed in Indiana¹⁵⁶ and Kansas.¹⁵⁷

A new Maine law¹⁵⁸ prohibits the retail distribution of veronal, or barbital, or any registered, trade-marked or copyrighted preparation registered in the United States Patent Office containing this substance, except on written prescription of a licensed physician, dentist or surgeon. The prior law seemed to permit the substance to be distributed on a written order of a physician, dentist or veterinarian or if dispensed by a licensed pharmacist. The prior law contained no limitation on the distribution of a registered, trade-marked or copyrighted preparation registered in the United States Patent Office containing the aforementioned substance unless the preparation contained more than 40 grains of the drug to the avoirdupois or fluid ounce.

A somewhat similar bill was killed in California.¹⁵⁹

SULFANILAMIDE.—Laws prohibiting the retail distribution of sulfanilamide except on the written prescription of a licensed physician, dentist or veterinarian were enacted in California,¹⁶⁰ Connecticut,¹⁶¹ Florida,¹⁶² Nevada,¹⁶³ North Carolina,¹⁶⁴ Pennsylvania,¹⁶⁵ Vermont¹⁶⁶ and Washington.¹⁶⁷

A similar bill was killed in Colorado.¹⁶⁸

144. Conn., Laws, 1939, c. 364.
145. Del., Laws, 1939, c. —, approved April 6, introduced as H. 143.
146. Fla., Laws, 1939, c. 19656 (S. 73 and H. 247 to accomplish same end were killed).
147. Ga., Laws, 1939, Gov. Act. No. 184.
148. Minn., Laws, 1939, c. 102 (a companion bill, S. 781, was also considered), c. 193.
149. Nev., Laws, 1939, c. 177.
150. N. Y., Laws, 1939, c. 778 (a companion bill, S. 1202, was also considered).
151. N. C., Laws, 1939, c. 320.
152. S. C., Laws, 1939, Gov. No. 514.
153. Tenn., Public Acts, 1939, c. 164 (a companion bill, H. 737, was also considered).
154. Vt., Laws, 1939, c. —, approved April 12, introduced as H. 31.
155. Wash., Laws, 1939, c. 6, c. 29 (similar bills, S. 24, S. 39 were also considered).
156. Ind. H. 477.
157. Kan. S. 13.
158. Me., Public Laws, 1939, c. 209.
159. Calif. S. 817.
160. Calif., Laws, 1939, c. 739.
161. Conn., Laws, 1939, c. 364.
162. Fla., Laws, 1939, c. 19656.
163. Nev., Laws, 1939, c. 177.
164. N. C., Laws, 1939, c. 320.
165. Pa., Acts, 1939, Act No. 64.
166. Vt., Laws, 1939, c. —, approved April 12, introduced as H. 31.
167. Wash., Laws, 1939, c. 27.
168. Colo. H. 1102.

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DINITROPHENOL.—A new California law ¹⁶⁹ makes it a felony for any person to sell, dispense, administer or prescribe dinitrophenol for the purpose of human consumption. Laws prohibiting the retail distribution of dinitrophenol except on the prescription of a licensed physician, dentist or veterinarian were enacted in Connecticut, ¹⁶¹ Florida, ¹⁶² Nevada ¹⁶³ and North Carolina. ¹⁶⁴

CINCOPHEN.—Laws prohibiting the retail distribution of cincophen except on the written prescription of a licensed physician, dentist or veterinarian were enacted in California, ¹⁷⁰ Connecticut, ¹⁷¹ Florida, ¹⁷² Nevada, ¹⁷³ North Carolina ¹⁷⁴ and Vermont. ¹⁷⁵

AMINOPYRINE.—Laws prohibiting the retail sale or distribution of aminopyrine except on the written prescription of a licensed physician, dentist or veterinarian were enacted in California, ¹⁷⁶ Connecticut, ¹⁷⁷ Florida, ¹⁷⁸ Nevada, ¹⁷⁹ North Carolina ¹⁸⁰ and Vermont. ¹⁸¹

DIPHENYLAMINE.—A new California law ¹⁸² makes it a felony to sell, dispense, administer or prescribe diphenylamine for any purpose.

MISCELLANEOUS DRUGS.—An unsuccessful attempt was made in North Carolina ¹⁸³ to provide that all medicinal preparations, whether proprietary, patented or sold on prescription, containing acetanilide or any of the bromides, must be marked "poison" on their containers. The Connecticut House killed a bill ¹⁸⁴ proposing to prohibit the sale or distribution of dangerous caustic or corrosive substances unless in containers bearing a conspicuous, easily legible label or sticker containing (a) the name of the article; (b) the name and place of business of the manufacturer, packer, seller or distributor; (c) the word "POISON" in letters of not less than 24 point size and (d) directions for treating a case of accidental personal injury. A bill was referred to the next session of the legislature in Massachusetts ¹⁸⁵ which proposed to prohibit the sale of any medicine "which in and of itself contains enough poison or other deadly drug so that if taken in whole or in part is sufficient to cause the death of the person taking it" unless the container is labeled so as to state the nature of the poison or the deadly drug, what quantity thereof would constitute a lethal dose, and the antidote therefor.

FOODS, DRUGS, COSMETICS AND THERAPEUTIC DEVICES.—Laws were adopted in California, ¹⁸⁶ Connecticut, ¹⁸⁷ Florida, ¹⁸⁸ Indiana, ¹⁸⁹ Nevada, ¹⁹⁰ New Jersey, ¹⁹¹ New York, ¹⁹² and North Carolina, ¹⁹³ repealing prior laws relating to food and drugs and enacting so-called uniform food, drug, cosmetic and device acts to regulate the manufacture, sale, distribution and advertising of foods, drugs, cosmetics and therapeutic devices. These new laws in general correspond with the provisions of the Federal Food, Drug, and Cosmetic Act of 1938.

Similar bills failed of passage in twenty states. ¹⁹⁴

Amendments to existing laws relating to foods and drugs were enacted in Arkansas, ¹⁹⁵ Georgia, ¹⁹⁶ Missouri ¹⁹⁷ and Oklahoma. ¹⁹⁸

Similar bills were killed in three states. ¹⁹⁹

A new law in Wyoming ²⁰⁰ prohibits the sale of adulterated and misbranded cosmetics.

A somewhat similar bill was killed in Pennsylvania. ²⁰¹ An unsuccessful attempt was made in North Dakota ²⁰² to amend the existing law relating to the sale and distribution of cosmetics.

An unsuccessful attempt was made in Michigan ²⁰³ to enact a new law relating to the manufacture, sale, distribution and advertising of foods.

IV. LEGISLATION RELATING TO LICENSES TO PRACTICE THE HEALING ART

A. Conditions Precedent to Licensure Imposed Alike on All Applicants, Nonsectarian or Cult

KNOWLEDGE OF THE BASIC SCIENCES.—Basic science laws were enacted in Florida ²⁰⁴ and South Dakota ²⁰⁵ which will require all applicants for licenses to practice any form of the healing art to demonstrate to a board of examiners a comprehensive knowledge of anatomy, chemistry, physiology, pathology and bacteriology before presenting themselves to their respective licensing boards for examination and licensure. The Florida board is to consist of five members learned in the basic sciences, selected from the faculties of the universities and colleges in Florida having four year college courses. On the other hand, the South Dakota board is to have a composite membership, one doctor of medicine, one osteopath, one chiropractor and two members who are to be full time professors or associate or assistant professors teaching the subject of the basic sciences in any university or college in the state accredited by the North Central Association of Secondary Schools and Colleges and who do not hold a degree in any of the healing arts.

Basic science bills were considered and killed in Georgia, ²⁰⁶ Missouri, ²⁰⁷ New Mexico, ²⁰⁸ North Dakota ²⁰⁹ and Rhode Island. ²¹⁰

A self-styled "basic science" bill was killed in South Dakota. ²¹¹ The bill was a basic science act in no reasonable sense of the term. It proposed to prohibit the medical board, the chiropractic board or the osteopathic board from admitting to examination any applicant who had not passed a satisfactory examination in the basic sciences named. However, instead of such applicants being examined by an impartial board in the subjects enumerated examinations in those subjects were to be given by the medical, chiropractic or osteopathic boards "to applicants for license in their respective professions."

194. Ark. H. 220; Calif. S. 517, S. 1215, S. 1208, A. 1131, A. 1177, A. 1147; Del. S. 79; Ga. H. 532; Fla. S. 624; Md. H. 250; Mass. H. 75; Mich. S. 460; Mo. H. 604; Mont. H. 101; N. M. S. 68; N. Y. S. 877; S. 1510, A. 279, S. 1424, A. 1927, A. 307, A. 1213; Okla. S. 219; Pa. H. 709, H. 1358; Tenn. H. 664, S. 499; Tex. H. 225; Utah S. 20; Wash. S. 15, S. 315; W. Va. S. 21; Wis. H. 225; Utah S. 20; 195. Ark. Acts, 1939, Act. 190.
196. Ga. Laws, 1939, c. 24, Att. 4.
197. Mo. Laws, 1939, c. 20.
198. Okla. Laws, 1939, c. 24, Att. 4.
199. Calif. Laws, 1939, c. 24, Att. 4.
200. N. Y. S. 1545, A. 1018; Mo. H. 349, H. 351, H. 352, H. 354, H. 662; Wyo. Laws, 1939, c. 104.
201. Pa. H. 728.
202. N. D. H. 261.
203. Mich. S. 225.
204. Fla. Laws, 1939, c. 19281.
205. S. D. Laws, 1939, c. 104.
206. Ga. S. 28.
207. Mo. S. 29.
208. N. M. H. 64.
209. N. D. H. 226.
210. R. I. S. 181.
211. S. D. H. 92.

169. Calif. Laws, 1939, c. 582.
170. Calif. Laws, 1939, c. 730.
171. Conn. Laws, 1939, c. 364.
172. Fla. Laws, 1939, c. 19656.
173. Nev. Laws, 1939, c. 177.
174. N. C. Laws, 1939, c. 320.
175. Vt. Laws, 1939, c. 320.
176. Calif. Laws, 1939, c. 320.
177. Conn. Laws, 1939, c. 730.
178. Fla. Laws, 1939, c. 364.
179. Nev. Laws, 1939, c. 19656.
180. N. C. Laws, 1939, c. 177.
181. Vt. Laws, 1939, c. 320.
182. Calif. Laws, 1939, c. 583.
183. N. C. H. 258.
184. Conn. H. 297.
185. Mass. H. 288.
186. Calif. Laws, 1939, c. 730, c. 731.
187. Conn. Laws, 1939, c. 364.
188. Fla. Laws, 1939, c. 19656.
189. Ind. Laws, 1939, c. 38.
190. Nev. Laws, 1939, c. 177.
191. N. J. Laws, 1939, c. 320.
192. N. Y. Laws, 1939, c. 797, c. 869.
193. N. C. Laws, 1939, c. 320.

An unsuccessful attempt was made so to amend the basic science act of Minnesota²¹² as to permit certain chiropractors to receive a certificate of registration in the basic sciences on application to the board. The Wisconsin assembly also killed a bill²¹³ which proposed in effect that chiropractic applicants submitting to the basic science examination should be examined by chiropractors designated by the state board of examiners of chiropractic.

CENTRAL LICENSING AGENCY.—Unsuccessful attempts were made in Connecticut²¹⁴ and Maine²¹⁵ to create a central licensing agency to exercise all the powers and functions heretofore vested in the secretaries of the various licensing boards of the state, including the medical examining board, the osteopathic board, the chiropractic board, the dental board and others.

B. Changes in Medical Practice Acts Affecting Nonsectarian Practitioners

BOARDS OF MEDICAL EXAMINERS.—*Composite Membership.*—Legislation was enacted in Georgia²¹⁶ and Massachusetts²¹⁷ repealing provisions in prior laws which, in effect, required representation on the board for various schools of medical practice. By the new Georgia law the board is to consist of ten physicians of any school of medical practice. The prior law required five members of the board to be regular physicians, three to be eclectic physicians and two to be homeopathic physicians. The new Massachusetts law struck out the provision in the prior law that no more than three members of the board of registration in medicine should at any one time be members of any one chartered state medical society.

An unsuccessful attempt was made in Oklahoma²¹⁸ to strike out the provision in the present law which requires one member of the board of medical examiners to be a physiomedic physician. A bill was killed in Massachusetts²¹⁹ also to require that two members of the board of registration in medicine be osteopaths.

Right of State Medical Society to Nominate Members.—A new Oregon law²²⁰ requires the Oregon State Medical Society on or prior to February 1 annually to nominate and certify to the governor the names of three qualified physicians to succeed the board member whose term expires that year. The governor, however, in making the required appointment is not restricted to the list so certified but may, if he so chooses, appoint any other physician "having the necessary qualifications." The law further provides that "present board members shall be deemed and taken to have been so certified by the said society."

Separate Eclectic Boards.—A bill was killed in Connecticut²²¹ which, if enacted, would have reestablished an eclectic board of medical examiners.

Board Meetings.—A new Alabama law²²² authorizes the board to fix the time at which examinations are to be held annually. The prior law required the board to give not less than two examinations annually. The new Oregon law²²³ previously referred to also requires the board to hold meetings for the examination of applicants for licenses on the second Tuesday, Wednesday and Thursday in January and the third Tuesday, Wednesday and Thursday in June of each year in

Portland and permits the board to hold special meetings for the examination of applicants for licenses in the same manner as other special meetings of the board are called.

Power to Reinstate Revoked License.—Laws adopted in New Jersey²²⁴ and Oregon²²⁵ permit the boards in question in their discretion to relicense without reexamination any person whose license to practice has been suspended or revoked.

Power to Regulate Conduct of Licentiate.—A new Delaware law²²⁶ authorizes the medical council to promulgate regulations "for the proper supervision and control of the professional conduct of all persons under its jurisdiction."

Power to Issue Subpoenas and Administer Oaths.—The new New Jersey law²²⁷ authorizes the secretary of the board, as well as the president, on whom alone the prior law conferred the powers to be referred to, (1) to issue subpoenas and (2) to administer oaths. A person refusing to appear in response to such a subpoena, or who, after appearing, refuses to be sworn or to testify is to be liable to a penalty of \$50. A new Tennessee law²²⁸ grants the president and secretary of the board in revocation or suspension proceedings power to administer oaths, issue subpoenas and to compel the attendance and testimony of witnesses.

CONDITIONS PRECEDENT TO LICENSURE.—*Educational Qualifications.*—Laws imposing educational qualifications in addition to those required by the prior laws on applicants for licenses to practice medicine were enacted in Ohio,²²⁹ Oregon²³⁰ and Texas.²³¹ The Ohio, Oregon and Texas laws, among other things, require, in effect, that applicants prior to their admission to medical school must have had at least two years premedical education in an approved college or university. The Oregon law provides, in addition, that an applicant must have graduated from a medical school or college on the approved list of the Council on Medical Education and Hospitals of the American Medical Association and must have completed an internship of at least one year in a hospital approved for internship training by the American Medical Association. The Texas law provides that an applicant must be a graduate of a bona fide reputable medical school which maintains a course of instruction of not less than four terms of eight months each, which offers courses of instruction in anatomy, physiology, chemistry, histology, pathology, bacteriology, diagnosis, surgery, obstetrics, gynecology, hygiene and medical jurisprudence and possesses and utilizes laboratories, equipment and facilities for proper instruction in all the subjects named. The Ohio law also requires applicants for licenses by reciprocity to possess the minimum educational qualifications exacted of applicants for licenses after examination.

The new New Jersey law²³² previously discussed also altered somewhat the educational qualifications required of applicants. Hereafter applicants must prior to the receipt of their professional diploma or degree have studied not less than four full school years, including four satisfactory courses of at least eight months

212. Minn. S. 683.

213. Wis. A. 227.

214. Conn. S. 305.

215. Me. H. 1645.

216. Ga., Laws, 1939, Gov. Act No. 261 (H. 190, a companion bill, was killed in the house).

217. Mass., Laws, 1939, c. 36.

218. Okla. H. 519.

219. Mass. H. 985.

220. Ore., Laws, 1939, c. 153.

221. Conn. H. 1009.

222. Ala., Laws, 1939, Gov. No. 122, introduced as H. 164.

223. Ore., Laws, 1939, c. 153.

224. N. J., Laws, 1939, c. 115.

225. Ore., Laws, 1939, c. 153.

226. Del., Laws, 1939, c. —, approved March 8, introduced as S. 26.

227. N. J., Laws, 1939, c. 115.

228. Tenn., Laws, 1939, c. 66.

229. Ohio, Laws, 1939, p. —, approved April 24, introduced as S. 97.

230. Ore., Laws, 1939, c. 153.

231. Tex., Laws, 1939, c. —, approved March 15, introduced as H. 148.

232. N. J., Laws, 1939, c. 115.

(rather than *seven* months as the prior law required) in some school of medicine or osteopathy in good standing in the opinion of the board, "which courses shall have included a thorough and satisfactory course of instruction in medicine and surgery." The prior law also required an acceptable internship. The new law requires an internship "or in lieu thereof" completion of "one year of postgraduate work acceptable to the board in a school or hospital approved by the board." Before an applicant begins his internship training in New Jersey or the alternative postgraduate study the law now requires him to obtain from the board a certificate of qualification and to present that certificate when he applies for a license. This new law also permits a person licensed to practice osteopathy to be examined and licensed prior to Nov. 1, 1941, to practice medicine and surgery on showing completion of an internship *acceptable to the board* in a hospital approved by the board or the completion of a postgraduate course of two years *acceptable to the board* in a college of osteopathy approved by the board, the changes effected by the new law being indicated by the italicized phrases.

A new California law²³³ so amends the prior medical practice act as to make no differentiation with respect to the requirements for licensure between graduates of Canadian medical schools approved by the board of medical examiners and graduates of approved American medical schools.

A bill was killed in Missouri²³⁴ to require applicants, in addition to existing educational qualifications, to have completed a premedical education consisting of a minimum of sixty semester hours of college credit in acceptable subjects from a reputable college or university approved by the board.

Citizenship Requirements.—Laws were adopted in Arkansas,²³⁵ Georgia,²³⁶ New Hampshire,²³⁷ New Jersey²³⁸ and Texas²³⁹ restricting licensure in medicine to citizens of the United States. A similar bill would have become law in California but for the pocket veto of the governor.²⁴⁰

Similar bills were considered and killed in Colorado²⁴¹ Connecticut,²⁴² Illinois²⁴³ and New York.²⁴⁴

Laws were enacted in Illinois,²⁴⁵ Massachusetts²⁴⁶ and New Mexico²⁴⁷ restricting licensure in medicine to citizens of the United States or to persons who have legally declared their intention of becoming such citizens.

A similar bill was killed in Massachusetts.²⁴⁸

In codifying the statutes of South Dakota, the code commissioners added to the provision of the medical practice act requiring an applicant to be a citizen of the United States a qualifying phrase "or a person who has declared his intention to become a citizen." The code as so worded was adopted by the legislature.²⁴⁹

Examination.—Laws were enacted in New Jersey and Texas relating to the examination to be given

applicants for licenses to practice medicine. The New Jersey law²⁵⁰ changes the provisions of the prior law listing the subjects in which applicants are examined, substituting "pharmacology" for "materia medica" and "diagnosis, including diseases of the skin, nose and throat" for "practice of medicine, including diseases of the skin, nose and throat." The Texas law²⁵¹ eliminates provisions in the prior law which permitted the examination to be taken in a language other than English. The new Texas law also requires applicants for a license by reciprocity to pass an oral examination "in practical subjects as may be prescribed by the board." The new New Jersey law also provides a fee for reexamination of \$25, the prior law not providing a fee for reexamination.

Licensure Without Examination.—Laws were enacted in New Jersey²⁵² and Ohio²⁵³ permitting the licensing without examination of diplomates of the National Board of Medical Examiners. The provisions of the Texas medical practice act permitting the licensing without examination of applicants licensed in other states was so amended this year as to limit such licensure to citizens of the United States and to licentiates of other states which accord a similar privilege to Texas licentiates. The new Texas law also (1) provides that such applicants must pass an oral examination in practical subjects prescribed by the board and (2) prohibits the issuance of a license by reciprocity to an applicant who does not hold a license from another jurisdiction giving him the same right to practice medicine in that jurisdiction as a license to practice medicine in Texas. A new Arkansas law²⁵⁴ permits the board to license without examination any honorably discharged medical officer of the United States Army, Navy or public health service, who has been licensed to practice in some other state of the union after examination, who has qualified under the basic science act of Arkansas, who has been a resident of the state for one year or more and who is a citizen of the United States.

REVOCATION, SUSPENSION OR REFUSAL OF LICENSES.

—Right to Suspend.—A new Delaware law²⁵⁵ authorizes the medical council to suspend, as well as to refuse to issue or revoke licenses to practice. So far as specific language is concerned, the prior law limited the council's authority in this respect to refusing to license or to revoking a license.

Causes.—Laws setting out grounds for the suspension, revocation or refusal of licenses, in addition to the causes or grounds stated in prior medical practice acts, were enacted in Arkansas, California, Delaware, New Jersey, Oregon and Texas. The new Arkansas law²⁵⁶ authorizes the board to refuse to grant or to revoke a license if the applicant or the holder is not an American citizen. The new California law²⁵⁷ makes it unprofessional conduct, which is a cause for revocation or suspension, for a licentiate knowingly to sign any certificate or other document required by law which falsely represents the existence or nonexistence

233. Calif., Laws, 1939, c. 281.

234. Mo. H. 462.

235. Ark., Laws, 1939, c. 342.

236. Ga., Laws, 1939, Gov. Act No. 238, introduced as S. 29.

237. N. H., Laws, 1939, c. —, approved May 24, introduced as S. 30.

238. N. J., Laws, 1939, c. 115.

239. Tex., Laws, 1939, c. —, approved March 15, introduced as H. 148.

240. Calif., A. 449.

241. Colo. S. 332, H. 481.

242. Conn. H. 1618.

243. Ill. H. 612, S. 241.

244. N. Y. A. 801, S. 1492.

245. Ill., Laws, 1939, p. —, approved July 12, introduced as S. 365.

246. Mass., Laws, 1939, c. 415.

247. N. M., Laws, 1939, c. —, approved March 9, introduced as H. 42.

248. Mass. S. 558.

249. S. D. Code of 1939, sec. 27.0301.

250. N. J., Laws, 1939, c. 115.

251. Tex., Laws, 1939, c. —, approved March 15, introduced as H. 148 (a companion bill, S. 74, was killed in the senate).

252. N. J., Laws, 1939, c. 115.

253. Ohio, Laws, 1939, c. —, approved April 24, introduced as S. 97.

254. Ark., Laws, 1939, Act 161.

255. Del., Laws, 1939, c. —, approved March 8, introduced as S. 26.

256. Ark., Laws, 1939, c. 342.

257. Calif., Laws, 1939, c. 342.

of a state of facts. The Delaware law²⁵⁸ makes the following additional grounds for the refusal to license or for the suspension or revocation of a license: (a) chronic drug addiction or (b) violation of regulations adopted by the medical council for the supervision and control of professional conduct. The New Jersey law²⁵⁹ sets forth the following as additional causes for disciplinary action: (a) adjudication of insanity; (b) habitual use of drugs or intoxicants; (c) fraudulent advertising; (d) employing unlicensed persons to perform work which can legally be done only by persons licensed to practice medicine in the state; (e) conviction of a violation of any federal or state law relating to narcotic drugs. The additional grounds set out by the new Oregon law²⁶⁰ consist of (a) "such conduct as would not be indulged in by an ethical physician and surgeon under all the circumstances, taking into consideration the good of the patient and public, the time and place"; (b) making false or misleading statements regarding the licentiate's skill or the value of his medicine, treatment or remedy in the treatment of any disease or other abnormal condition of the human mind or body, or (c) advertising or holding one's self out to treat diseases or other abnormal conditions of the human body by any secret formula, medicine, method, treatment or procedure. Several additional grounds are set out in the new Texas law,²⁶¹ among them being (a) the use of any advertising statement of a character tending to mislead or deceive the public; (b) advertising professional superiority, or the performance of professional service in a superior manner; and (c) employing directly or indirectly any person whose license to practice has been suspended, or association in the practice of medicine with any person whose license to practice has been suspended or any person who has been convicted of the unlawful practice of medicine in Texas or elsewhere.

Unsuccessful attempts were made in four states to provide grounds for the revocation or suspension of licenses, in addition to the grounds now stated in present medical practice acts.²⁶²

Procedure.—Laws relating to the procedure to be followed in revocation or suspension proceedings were adopted in five states. A new Delaware law²⁶³ permits the medical council to act on its own motion as well as on complaints in writing made to it. A New Jersey law²⁶⁴ provides that in such proceedings against a licentiate because of the licentiate's conviction of a crime involving moral turpitude or of violating any federal or state law relating to narcotic drugs, the accused physician need not be furnished with a copy of the complaint nor need he be given a hearing. A new Oregon law²⁶⁵ specifies in detail the procedure the board must follow in revoking or suspending a license. In brief, the law requires that before the board can institute proceedings there must be filed with it a complaint under oath setting forth the facts on which the charge is based, which complaint must be filed not later than three years after the commission of the acts complained of. The board must then serve on the accused physician a written notice, stating the time and place of the hearing on those charges, together with a copy of the complaint. At

the hearing, the accused and his attorney shall have ample opportunity to present a defense, including the right to subpoena witnesses and necessary documents, and a stenographic report of the proceedings must be made. The practice in such proceedings must conform as nearly as practicable to equity suits. In Tennessee a law was enacted²⁶⁶ which provides that in such proceedings the affected licentiate must be given fifteen days' notice to prepare for a hearing and at the hearing he is entitled to be heard in person or by counsel or both. The board is given the power to make all needed procedural rules for such hearings and to employ an attorney to represent it. In Texas a new law²⁶⁷ amends the corresponding provisions of the prior law so as to provide that in instituting a disciplinary proceeding the appropriate district or county attorney, whom the law authorizes to prosecute such proceedings, must file with the appropriate court a complaint in writing, stating the grounds of the proceeding and signed officially by the prosecuting official instituting it.

Unsuccessful attempts were made in Arkansas,²⁶⁸ California²⁶⁹ and Oklahoma²⁷⁰ to amend the provisions of the medical practice acts relating to the procedure to be followed in revocation proceedings or appeals therefrom. Of most interest is one of the Oklahoma bills,²⁷¹ which proposed that a licentiate appealing from an order of revocation or suspension might appeal to the district court of the county of his residence, which was to try the case de novo, and that no decision of the board's revoking or suspending a license should become final "pending final decision of the Supreme Court of this State."

ANNUAL REGISTRATION.—Unsuccessful attempts were made in Indiana,²⁷² Massachusetts,²⁷³ Missouri²⁷⁴ and Oklahoma²⁷⁵ to require the annual registration of physicians and the payment of an annual registration fee. An unsuccessful attempt was made in Utah²⁷⁶ to raise to \$10 the annual license renewal fee required of physicians and surgeons, osteopaths, chiropractors and dentists.

RECORDING OF LICENSES.—The Wisconsin law requiring a licensed physician to record his license with the county clerk of the county in which he resides was so amended this year²⁷⁷ as to require nonresident physicians to file their Wisconsin licenses with the county clerk in each county in which they practice.

POSTING OF NAMES AT ENTRANCE TO OFFICE.—A new New Jersey law²⁷⁸ requires every person practicing medicine under a firm name and every person practicing medicine as an employee of another to cause his name to be conspicuously displayed and kept in a conspicuous place at the entrance of the place where such practice is conducted. Failure to comply with this requirement subjects the offender to a penalty of \$100.

INTERNS AND RESIDENT PHYSICIANS.—A new Idaho law²⁷⁹ permits "students who have had training in recognized medical colleges in good standing and who are performing the duties of an intern in . . . any duly organized hospital . . . operating under the supervision of a medical staff" freely to perform their

258. Del., Laws, 1939, c. —, approved March 8, introduced as S. 26.

259. N. J., Laws, 1939, c. 115.

260. Ore., Laws, 1939, c. 153.

261. Tex., Laws, 1939, c. —, approved March 15, introduced as H. 148.

262. Calif. A. 438; Iowa H. 543; N. Y. A. 737, A. 756; Okla. H. 519.

263. Del., Laws, 1939, c. —, approved March 8, introduced as S. 26.

264. N. J., Laws, 1939, c. 115.

265. Ore., Laws, 1939, c. 153.

266. Tenn., Laws, 1939, c. 66.

267. Tex., Laws, 1939, c. —, approved March 15, introduced as H. 148.

268. Ark. S. 308.

269. Calif. A. 2745.

270. Okla. H. 519, S. 101.

271. Okla. H. 519.

272. Ind. H. 471.

273. Mass. H. 60.

274. Mo. H. 590.

275. Okla. H. 496.

276. Utah H. 192.

277. Wis., Laws, 1939, c. 114.

278. N. J., Laws, 1939, c. 115.

279. Id., Laws, 1939, c. 52.

duties without an examination or the issuance of a license to practice medicine. An amendment adopted to the California medical practice act this year²⁸⁰ authorizes any graduate student registered with the board of medical examiners and on whom a degree of Doctor of Medicine, Bachelor of Medicine, or Doctor of Osteopathy has been conferred and any regularly matriculated student in a school approved by the board to register with the board and to be permitted for a period not to exceed two years to treat the sick and afflicted either as a student in the school or as an intern in a hospital approved for the training of interns. Such persons so registered may for rendering treatment receive compensation from the hospital or school concerned. Except as authorized by this amendment, no graduate student may treat the sick or afflicted or receive compensation therefor. A new New Jersey law²⁸¹ limits the exemption from the medical practice act accorded to members of the resident staffs of charitable or municipal hospitals or asylums by providing that the exemption shall not apply with respect to an individual after he has served as a resident physician for a total period of two years and that the exemption applies only with respect to an individual who has received from the board a certificate of qualification prior to serving in such capacity.

A bill was killed in Maryland²⁸² proposing that any person shall be regarded as practicing medicine who receives compensation from the state for the treatment of patients in private or public mental hospitals, including resident or assistant resident physicians.

ACTS CONSTITUTING THE PRACTICE OF MEDICINE.—A new Texas law²⁸³ provides that the medical practice act is to apply to persons, other than registered pharmacists not pretending to be physicians, who offer for sale in public places contraceptives, prophylactics or remedies which they recommend for the cure of disease.

A bill, killed in Iowa,²⁸⁴ proposed that any person, firm, association or corporation acting in any manner as an agency for bringing a licentiate and patient together or unlawfully employing, arranging with or by subterfuge procuring the services of a licensed practitioner shall be deemed to be practicing medicine, osteopathy, chiropractic, dentistry, optometry or podiatry, as the case might be, without a license. The Maryland legislature, as previously noted, killed a bill²⁸⁵ which proposed that any person should be regarded as practicing medicine who should receive compensation from the state for the treatment of patients in private or public mental hospitals, including resident or assistant resident physicians. An unsuccessful attempt was made in Massachusetts²⁸⁶ to provide that the term "practice of medicine" or "rendering medical service," as used in the medical practice act, should include "any examination or treatment of a human being, by the use or disuse of any means, for the purpose of diagnosing, preventing or curing any deviation from normal condition of mind or body, or for the purpose of relieving any condition of mind or body whether arising from such a deviation or otherwise." A bill was likewise killed in Nevada²⁸⁷ to make it unlawful for any person to practice medicine, surgery, *anesthesia* or *obstetrics* without being licensed by the board of medical examiners. The present law does not specifically prohibit the practice of *anesthesia* by persons not licensed by the board of medical examiners. An effort failed in Texas²⁸⁸ to make it unlawful for any person other than a licensed physician to offer for sale any truss or

other mechanical device commonly used for the relief of rupture or hernia except on the written prescription of a licensed physician. The bill also proposed to make it unlawful for any person other than a licensed physician to offer to fit any such truss or mechanical device. A bill died in the senate of Washington²⁸⁹ to make it unlawful for any person operating a bath-house, massage parlors or similar establishments to furnish by himself or by an agent any bath, massage or other treatment or to attempt to treat any disease, injury or condition of health, unless the person so doing is licensed to practice one of the healing arts authorized by the laws of the state.

A bill was killed in Connecticut²⁹⁰ to prohibit the sale of any arch support, braces or other foot and leg appliances except on the prescription of an orthopedic surgeon or of the state health commissioner. An unsuccessful attempt was made in Missouri²⁹¹ to prohibit the sale, prescribing or fitting of any hearing aid device except by a licensed physician or on his prescription.

PERSONS OR ACTS EXCEPTED FROM THE PROVISIONS OF THE MEDICAL PRACTICE ACT.—*Christian Scientists.*—The provisions of the Texas medical practice act providing that nothing therein shall "effect or limit in any way the application or use of the principles, tenets or teachings of any church in the ministration to the sick or suffering by prayer without the use of any drug or material remedy, provided sanitary and quarantine laws and regulations are complied with" and that no charge is made therefor, directly or indirectly was amended this year²⁹² by (1) eliminating the phrase italicized and (2) by adding the following phrase "and provided, further, that all those so ministering or offering to minister to the sick or suffering by prayer shall refrain from maintaining offices, except for the purpose of exercising the principles, tenets, or teachings of the church of which they are bona fide members." The effect of this amendment would seem to be to permit such practitioners legally to charge for their services.

Unsuccessful attempts were made in Ohio²⁹³ and West Virginia²⁹⁴ to provide that the provisions of the medical practice act should not be construed to apply to the practice of Christian science, provided that the laws, rules and regulations relating to communicable diseases and sanitary matters were not violated.

General.—The provisions of the New Jersey medical practice act which exempted therefrom a commissioned surgeon or physician of the United States Army, Navy or Marine hospital service were so amended this year²⁹⁵ as to require a person claiming such an exemption to be actively engaged in the performance of his official duties and by stating specifically that this exemption does not apply to reserve officers or national guard officers. This law also specifically exempts "a graduate physiotherapist . . . electro-therapist, or hydro-therapist, while operating in each particular case under the specific direction of a regularly licensed physician or surgeon. This exemption shall not apply to such assistants of persons who are licensed as osteopaths, chiropractors, optometrists or other practitioners holding limited licenses." Additional provisions of this law which place restrictions and limits on the exemption granted in favor of resident physicians have previously been noted.

280. Calif., Laws, 1939, c. 341.

281. N. J. Laws, 1939, c. 115.

282. Md. H. 754.

283. Tex., Laws, 1939, c. —, approved March 15, introduced as

H. 148 (a companion bill S. 74 was killed in the senate).

284. Iowa H. 543.

285. Md. H. 754.

286. Mass. S. 258.

287. Nev. S. 70.

288. Tex. H. 897.

289. Wash. S. 41.

290. Conn. S. 780.

291. Mo. H. 182.

292. Tex., Laws, 1939, c. —, approved March 15, introduced as H. 148. Other bills proposing to accomplish approximately the same purpose were also before the Texas legislature (S. 26, H. 10, S. 74) but were not enacted.

293. Ohio H. 392.

294. W. Va. S. 152.

295. N. J. Laws, 1939, c. 115.

Interns.—There has been previous discussion with respect to the exemptions granted interns by laws enacted in California, Idaho and New Jersey.

Alien Physicians.—Two bills were withdrawn from the consideration of the Wisconsin legislature²⁹⁶ which proposed a method by which "fifty medical physicians who may have been engaged in the actual practice of medicine or surgery in Germany, Austria, Czechoslovakia or Poland" might be permitted to practice in the state without conforming to the requirements of the medical practice act.

ENFORCEMENT PROVISIONS.—Use of the Injunctive Process.—A new New Jersey law²⁹⁷ authorizes the court of chancery at the suit of the Attorney General or of the board of medical examiners to restrain the unlicensed practice of medicine and various other violations of the medical practice act.

Bills to permit courts to enjoin the unlicensed practice of medicine failed of enactment in California,²⁹⁸ Missouri,²⁹⁹ New York³⁰⁰ and North Dakota.³⁰¹

Penalties.—Laws amending the penalty provisions of medical practice acts were enacted in Arizona, New Jersey, Oregon and Texas. The Arizona law³⁰² makes it a felony to practice or attempt to practice medicine without having a valid recorded license so to practice issued by the state board of medical examiners. The prior law made it a felony to practice or attempt to practice without having a valid recorded certificate. The New Jersey law³⁰³ authorizes the imposition on a person convicted for the second time of violating the medical practice act of a penalty of \$500. If a defendant so convicted fails to pay the penalty, the court is authorized to commit him to jail for not less than thirty days nor more than two hundred days. The new Oregon law³⁰⁴ makes it mandatory on the court to sentence a defendant, convicted for the second or subsequent time of a misdemeanor under the medical practice act, to the county jail for not less than ten days, in addition to whatever other fine or imprisonment is permitted by the medical practice act. The new Texas law³⁰⁵ reduces to thirty days the maximum imprisonment that can be imposed on a person convicted of practicing medicine without a license. As the law now reads, a person convicted of practicing without a license is guilty of a misdemeanor and is to be punished by a fine of not less than \$50 nor more than \$500 and by imprisonment in the county jail for not more than thirty days.

An unsuccessful attempt was made in New Jersey³⁰⁶ to increase the penalty to be imposed on persons convicted of practicing without a license.

Miscellaneous.—Among other things, the amendments to the Texas medical practice act enacted this year,³⁰⁷ referred to in several connections heretofore, eliminated the provisions in the prior law that permitted the board to license applicants to practice obstetrics alone. By a new Ohio law³⁰⁸ the fines collected for violations of the medical practice act are to be distributed one half to the board of medical examiners

and one half to the county or municipality in which the offense was committed.

A bill was killed in Arkansas³⁰⁹ to make it unlawful for a physician to practice under any name except his own true name or to operate, treat, practice, manage or be employed in any room, office, hospital or clinic where medical treatment is administered or done under the name of any unlicensed person, corporation, company, association or trade name; or to assist or aid in any manner any unlicensed person to practice medicine.

C. Changes in Cult Licensing Laws

OSTEOPATHS.—Amendments were adopted this year in Delaware, Florida, Maine, New Jersey, New York, Oklahoma and Tennessee to the laws relating to the practice of osteopathy in force in those states.

Probably most important is the new Tennessee law,³¹⁰ which extensively amended the prior osteopathic practice act and which without doubt grants to osteopaths now licensed and to be licensed in the future the right to practice medicine and surgery without restriction. Specifically, the new law states that a license to practice osteopathy shall entitle the holder thereof "to practice osteopathy in any county in this state, in all its branches, as taught and practiced by the recognized associated colleges of osteopathy, with the right to use such drugs as are necessary in the practice of osteopathy, surgery, and obstetrics, including narcotics, antiseptics, anesthetics, and biologicals." The law further provides that osteopaths shall observe and be subject to all state and municipal regulations relating to the control of contagious diseases, the reporting and certifying of births and deaths and all matters pertaining to public health, and such reports must be accepted by the officer or department to whom they are made, equally with the reports of physicians of any other school of medicine.

The new New York law³¹¹ provides that any licensed osteopath or any applicant for such a license "who upon the submission of proper credentials or by examination satisfies the regents that he has received sufficient instruction and training, may be granted the right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics and biological products."

The new Delaware law provides that (1) osteopathic applicants are to be examined by the medical council and an osteopath designated by the Delaware State Osteopathic Society; (2) such applicants must be examined in the subjects enumerated in the prior law and in addition "Therapeutics"; and (3) such applicants must present evidence, in addition to the qualifications as now required by law, that they have completed two years of acceptable college work, including English, physics, chemistry and biology, and have served as interns for one year in hospitals recognized by the American Osteopathic Association or by the American Medical Association.³¹²

The new Florida law³¹³ requires licensed osteopaths to register annually on or before January 1 with the osteopathic board and at that time to pay annual registration fees of \$5 and to condition the renewal of a license to practice osteopathy on the presentation by the holder thereof of evidence that in the preceding year the licentiate has attended the two day educational program as conducted by the Florida osteopathic association, or its equivalent as approved by the board of osteopathic examiners.

296. Wis. S. 239, A. 692.

297. N. J. Laws, 1939, c. 115.

298. Calif. A. 484.

299. Mo. H. 548.

300. N. Y. S. 180, A. 260.

301. N. D. S. 194.

302. Ariz. Laws, 1939, c. 74.

303. N. J. Laws, 1939, c. 115.

304. Ore. Laws, 1939, c. 153.

305. Tex. Laws, 1939, c. —, approved March 15, introduced as H. 148.

306. N. J. S. 167.

307. Tex. Laws, 1939, c. —, approved March 15, introduced as H. 148.

308. Ohio, Laws, 1939, c. —, approved April 24, introduced as S. 97.

309. Ark. S. 463.

310. Tenn. Public Acts, 1939, c. 150.

311. N. Y. Laws, 1939, c. 741.

312. Del. Laws, 1939, c. —, approved March 3, introduced as H. 54.

313. Fla. Laws, 1939, c. 19 1/2.

The new Maine law³¹⁴ requires osteopaths to renew their licenses annually and to pay an annual renewal fee of \$2 and to condition annual renewal on the presentation to the board by each licensee of satisfactory evidence that he has attended at least two days of the annual educational program conducted by the state osteopathic association, or its equivalent, to the approval of the board in the preceding year.

One new New Jersey law³¹⁵ defines osteopathy to "include the diagnosing, treating, operating or prescribing for any human disease, pain, injury, deformity, mental or physical condition; provided, however, that a license to practice osteopathy shall not permit the holder thereof to prescribe, administer or dispense drugs for internal use in the treatment of any human ailment, disease, pain, injury, deformity, mental or physical condition or to perform such surgical operations as require cutting." Another new New Jersey law³¹⁶ provides that any person holding a valid license to practice osteopathy within the state shall be authorized to continue to practice osteopathy, as just defined, pursuant to said license, as though the act under which said license had been issued had not been repealed. The latter law apparently was necessary because the extensive amendments to the medical practice act adopted in 1937, which eventually will confer on osteopaths the right to practice medicine and surgery without restriction, left in doubt the right of osteopaths licensed in the past to continue to practice osteopathy in the limited form just noted.

The new Oklahoma law³¹⁷ requires licensed osteopaths to register annually with the state board of osteopathic examiners, to pay annual licensing fees of \$2 and to condition the renewal of such a license on the submission of proof that the licensee has attended at least two days of the annual educational program conducted by the Oklahoma State Osteopathic Association in the year preceding application for renewal.

Two unsuccessful attempts were made in Illinois³¹⁸ to enact a separate osteopathic practice act and to create an independent examining committee to examine and license persons to practice osteopathy, which the bills proposed to define as "a system of practice of the healing arts in all its branches with therapeutics majoring in manipulation." Unsuccessful attempts were made in eleven states to amend existing laws relating to the practice of osteopathy.³¹⁹ Bills rejected in Kansas, if enacted, would have granted a licensed osteopath the right to practice osteopathy in all its branches, which, the bill stated, includes "operative surgery with instruments, physiotherapy and the use of drugs, as taught and practiced in the legally incorporated colleges of osteopathy of good repute, and the right to register under the laws of the United States of America governing narcotics." The Connecticut and Oregon bills proposed to extend the scope of a license to practice osteopathy by permitting a licensee to practice osteopathy as taught in the branches and embraced in the subjects covered by the examinations provided by the bills, which might have indicated that a licensee could practice surgery and obstetrics. In addition, the Oregon bill proposed to deprive the board of medical examiners of their present jurisdiction in examining and licensing osteopaths and would have established an independent board of osteopathic examiners. The Ohio and South Dakota bills specifically would have permitted the examining boards to license osteopaths to practice surgery.

CHIROPRACTORS.—Amendments to laws regulating the practice of chiropractic were adopted in Connecticut,³²⁰ Delaware,³²¹ Georgia,³²² New Hampshire,³²³ New Jersey,³²⁴ South Dakota,³²⁵ Tennessee³²⁶ and Wyoming.³²⁷ Of greatest interest is the new New Jersey law, which repealed all provisions in the prior law which permitted the issuance of limited licenses to chiropractors. Until July 31, 1944, persons graduating from chiropractic schools subsequent to 1921 may be licensed to practice chiropractic, which is defined as "the detecting and adjusting, by hand only, of vertebral subluxations." Thereafter chiropractic applicants must possess the same educational qualifications as physicians and surgeons and will receive identical licenses. Until Jan. 1, 1940, persons graduating from chiropractic schools prior to 1921 may be licensed to practice chiropractic as just defined.

The new Connecticut and Georgia laws require chiropractors to renew their licenses annually with the board and condition that renewal on attendance at at least one of the two day "educational" programs conducted by the state chiropractic association during the preceding year. In addition, the Georgia bill requires applicants for licenses to practice chiropractic to have graduated from chiropractic schools, which require for graduation a period of active attendance equivalent to a standard four year college course instead of the past requirement that such applicants have graduated from chiropractic schools requiring a course of three years of six months each. The new Delaware law amends the prior chiropractic act so as to authorize the board of chiropractic examiners to refuse to issue or to reissue a license for any of the following causes: material misrepresentation of facts in applications to practice; chronic and persistent inebriety or chronic drug addiction; the practice of criminal abortion; public advertising of special ability to cure chronic incurable diseases; and the presentation to the board of examiners of licenses that had been illegally obtained or have been signed or issued unlawfully or under fraudulent representation. The Delaware law also prohibits the issuance of an occupational license by the state for the practice of chiropractic unless the applicant has first procured from the board of examiners a certificate required by the chiropractic practice act. The new New Hampshire law limits licensure to citizens of the United States or of a Canadian province in which a like privilege is granted to citizens of the United States.

The new South Dakota law (1) provides that the practice of chiropractic "shall be limited to the methods of practice as taught in the standard colleges of chiropractic recognized by the state board of chiropractic examiners," thus replacing provisions in the prior law which limited the practice of chiropractic to "the adjustment by hand of the articulations of the human spine and other incidental adjustments according to the science of chiropractic" and specifically prohibited chiropractors from practicing obstetrics or treating contagious or infectious diseases; (2) requires chiropractic applicants to be examined in anatomy, bacteriology, physiology, chemistry, pathology, histology, gynecology, symptomatology, hygiene and public health, diagnostic x-ray and principles and practice of

314. Me., Public Laws, 1939, c. 206.

315. N. J., Laws, 1939, c. 115.

316. N. J., Laws, 1939, c. 361.

317. Okla., Laws, 1939, p. —, approved May 12, introduced as

H. 638.

318. Ill. S. 292, H. 293.

319. Conn. S. 931; Ga. S. 139; Fla. S. 211; Ida. S. 144; Kan. H. 147; S. 171, S. 464; Mo. H. 111, H. 658; Neb. Bill 392, Bill 181; Ohio H. 72; Ore. S. 475; S. D. H. 24; Wis. S. 192, S. 183.

320. Conn., Laws, 1939, c. 195.

321. Del., Laws, 1939, c. —, approved May 1, introduced as S. 269.

322. Ga., Laws, 1939, Gov. Act No. 253, introduced as S. 117.

323. N. H., Laws, 1939, c. 139.

324. N. J., Laws, 1939, c. 115.

325. S. D., Laws, 1939, c. 101.

326. Tenn., Public Acts, 1939, c. 116.

327. Wyo., Laws, 1939, c. 54.

chiropractic, and (3) requires an applicant to have acquired a high school education and to be a graduate of an approved chiropractic school, which requires for graduation a period of actual attendance equivalent to the standard four year college course, teaching adequate courses in the basic sciences and all subjects pertaining to the practice of chiropractic.

The new Tennessee law ³²⁸ (1) makes eligible for examination and licensure any applicant who is of good moral character, who has a preliminary school education equal to that of a standard accredited high school and who is a graduate of a school of chiropractic giving adequate courses in anatomy, physiology, symptomatology, spinal analysis, hygiene, sanitation, principles and practice of chiropractic and requiring actual attendance of three school years of not less than nine months each, or 3,600 hours of actual class attendance; (2) raises the examination fee to \$25 from \$15, and (3) sets out causes for the revocation, suspension or refusal of licenses.

The new Wyoming law ³²⁹ requires applicants for licenses to practice chiropractic to be graduates of recognized schools of chiropractic in which they have actually attended a course of study for at least four years of nine months each, preceded by a four year high school course or its equivalent.

Bills were killed in Illinois,³³⁰ Massachusetts,³³¹ New Jersey,³³² New York³³³ and Pennsylvania³³⁴ to enact separate chiropractic practice acts and create independent chiropractic examining boards.

Unsuccessful attempts were made in six states³³⁵ to amend existing chiropractic practice acts. The Iowa, Nebraska and Rhode Island bills, if enacted, would have extended the scope of a license to practice osteopathy.

An unsuccessful attempt was made in New Jersey³³⁶ to permit a particular chiropractor to be examined in physiotherapy and dietetics and thus to secure a license to practice physiotherapy and dietetics.

An unsuccessful attempt was also made in Washington³³⁷ to create a self-styled "Washington State Chiropractors' Association," which was to operate as an agency of the state and was to be composed of all persons licensed to practice chiropractic in the state. The association apparently was to have the power to fix the qualifications, requirements and procedure for admission to the practice of chiropractic and to establish and enforce rules of professional conduct for its members.

NATUROPATHS.—Amendments to existing naturopathic practice acts were enacted in Connecticut³³⁸ and Utah.³³⁹ The new Connecticut law defines the practice of naturopathy as "the practice of the psychological, mechanical and material sciences of healing as follows: The psychological sciences, such as psycho-therapy; the mechanical sciences, such as mechano-therapy, articular manipulation, corrective and orthopedic gymnastics, neuro-therapy, physio-therapy, hydro-therapy, electro-therapy, thermo-therapy, photo-therapy, chromo-therapy, vibro-therapy, concussion and pneumato-therapy, and the material sciences, such as dietetics, and external applications; but shall not mean internal medication or the administering of any substance simulating medicine or the form of medicine, except dehydrated foods."

The new Utah law requires an applicant for a license to practice naturopathy to be a graduate of a legally chartered naturopathic college, in good standing at the time of his graduation, which requires as a prerequisite to graduation at least a four years residence course of instruction over a period of four school years of not less than eight and one-half months of actual school attendance and study in each of such school years, comprising at least 4,500 hours in class work in the subjects required in such school, and in addition such an applicant must be a graduate from a high school requiring an attendance through four school years equal to fifteen units and have completed one year of college work in a college of liberal arts approved by the department of registration. In addition, each applicant must have a course of training of not less than twelve months in a hospital approved by the board of naturopathic physicians or a course of training for a period of twelve months in the office of a licensed naturopath in the state.

Unsuccessful attempts were made in fourteen states³⁴⁰ to enact separate naturopathic practice acts and to create independent boards of naturopathic examiners to examine and license applicants for licenses to practice naturopathy.

Unsuccessful attempts were made to amend the naturopathic practice act of four states.³⁴¹ Bills in three of these states (Florida, Oregon and Utah), if enacted, would have enlarged the scope of a license to practice naturopathy in those states.

An attempt was made again this year in Connecticut,³⁴² which was unsuccessful as in the past, to create certain stated persons a body politic and incorporate by the name of The College of Natureopathic Physicians. The object of the corporation was to be the instruction in the principles, practice and theory of naturopathy and the corporation, it was proposed, was to have the right to establish and maintain hospitals, sanatoriums, infirmaries and clinics and also to award the degree of Doctor of Natureopathy.

An unsuccessful attempt was made so to amend the medical practice act of New Jersey³⁴³ as to authorize the issuance of licenses to naturopaths and to provide that two members of the board of medical examiners be naturopaths.

MASSAGE.—Unsuccessful attempts were made in two states³⁴⁴ to enact separate massage practice acts and to create independent boards to examine and license persons applying for licenses to practice massage.

FAITH HEALERS.—Reference has previously been made on page 885 of the survey concerning legislation enacted and proposed this year relating to faith healers.

SANIPRACTORS.—An unsuccessful attempt was made in Washington³⁴⁵ to enact a separate sanipractic practice act and to establish a sanipractic physicians' examining board, to examine and license persons to practice sanipractic. The bill proposed the following definition for sanipractic: "the science and art of applied prophylactic and therapeutic sanitation, which enables the physician to direct, advise, prescribe or apply food, water, roots, herbs, light, heat, exercises active and passive, manipulation, adjusting tissue, vital organs and anatomical structure by manual, mechanical or electrical instruments or appliances; or other natural agency, to assist nature restore a psychological and physiological interfunction for the purpose of maintaining a normal state of health in mind and body." The bill went on to state that the foregoing definition was copyrighted in 1919 for the purpose of protecting a separate and coordinate principle of healing.

DRUGLESS THERAPY.—NATURAL HEALING ARTS.—Bills proposing to enact separate practice acts for drugless therapists.

328. Tenn., Public Acts, 1939, c. 116 (a companion bill, S. 255, died in the senate).

329. Wyo. Laws, 1939, c. 54.

330. Ill. H. 282.

331. Mass. H. 2151.

332. N. J. S. 205, A. 459.

333. N. Y. A. 794.

334. Pa. H. 786.

335. Colo. S. 675, H. 1000; Iowa H. 120, H. 364, H. 431;

Kan. H. 259; Neb. Bill 444; Okla. H. 624; R. I. S. 160.

336. N. J. A. 493.

337. Wash. S. 322.

338. Conn. Laws, 1939, c. 247.

339. Utah, Laws, 1939, c. —, approved Feb. 27, introduced as S. 34.

340. Calif. A. 1203; Ga. H. 47; Ill. H. 327; Kan. H. 44; Md. S. 85; Mich. S. 269; N. M. S. 8; N. C. S. 336; N. D. H. 287; Okla. H. 329; R. I. S. 198; Tenn. H. 392, S. 635; Tex. H. 312; Wyo. H. 167.

341. Ariz. S. 165; Fla. H. 392; Ore. S. 435; Utah S. 33.

342. Conn. H. 645.

343. N. J. A. 296.

344. Conn. S. 168; Fla. H. 304.

345. Wash. S. 263.

drugless practitioners and practitioners of the natural healing arts and to create independent examining and licensing boards were killed in Illinois,³⁴⁶ Indiana³⁴⁷ and Pennsylvania³⁴⁸ respectively.

PHYSIOTHERAPY.—Unsuccessful attempts were made in three states³⁴⁹ to enact a separate physiotherapy practice act and to create an independent board of examiners to examine and license persons desiring to practice physiotherapy. Somewhat similar was the proposal killed in Florida³⁵⁰ to enact a massage practice act and to establish an independent board of examiners to examine and license persons desiring to practice massage, which the bill stated was to be permitted to employ, among other agencies, phytotherapy, dietetics, psychotherapy, suggestotherapy, hydrotherapy, zone therapy, biochemistry, external applications, electrotherapy, mechanotherapy, mechanical and electrical appliances, hygiene, first aid, sanitation, heliotherapy, spinal manipulation and manual bodily manipulation.

An unsuccessful attempt was made in New York³⁵¹ to supplement the medical practice act by enacting a series of provisions with respect to the practice of physiotherapy and to provide a means whereby persons may be licensed to practice physiotherapy.

346. Ill. H. 876.

347. Ind. H. 276.

348. Pa. H. 565.

349. Conn. S. 168; Ill. S. 390, H. 1068; Okla. S. 104.

350. Fla. H. 384.

351. N. Y. S. 965.

PSYCHOLOGISTS.—Bills were killed in Illinois³⁵² and Kansas³⁵³ to enact what in effect were separate psychology practice acts and to create boards of examiners for psychologists. The bills proposed to prohibit any person from practicing as a consulting psychologist without a certificate of registration or a license from the examining board. Apparently no doctor of medicine would have been entitled to receive such a license unless he possessed the degree of doctor of philosophy and psychology or the degree of doctor of science and psychology or the degree of doctor of education or doctor of philosophy and education.

MISCELLANEOUS.—A series of New York bills, all of which were killed,³⁵⁴ proposed to prohibit the practice of roentgenology or radiology except by licensed physicians, osteopaths, dentists or chiropradists, subject, however, to the conditions and limitations of their respective licenses.

A bill was also killed in New York³⁵⁵ which proposed to authorize the board of supervisors in any county to regulate the installation and operation of any machinery, equipment or apparatus to be used for the examination or demonstration of any person or thing by means of fluoroscopic exhibition or shadow imagery registered with photographic materials and the use of roentgen rays.

(To be continued)

352. Ill. S. 467.

353. Kan. H. 448.

354. N. Y. S. 1892, S. 969, A. 1064.

355. N. Y. S. 1893.

OFFICIAL NOTES

ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Second Annual Meeting, held in Chicago, Jan. 15 and 16, 1940

DR. STANLEY J. SEEGER, Milwaukee, in the Chair

JANUARY 15—MORNING

Report of the Council on Industrial Health

DR. STANLEY J. SEEGER, Milwaukee: The first Congress on Industrial Health, held last year, revealed the complex nature of some of the problems in this field, as well as the vast extent of the field itself. The fact which emerged was one which had previously impressed industrial health workers, namely that conditions of work and their effect on health in relation to every kind of human activity would eventually come into the ambit of medical study and research. At a congress such as this, it is essential to limit our considerations to basic questions which are adaptable to specific application and to authentic reviews having a wide interest to the medical profession. The rapid advance of science has outstripped in many instances the advances of social and professional organization which would make possible the utilization of our knowledge. Controlled experiment is difficult to apply in industry because investigation involves the collection of numerous data on variables which are of value only when collected on a large scale and properly coordinated.

The desirability of a coordination of effort must be apparent even on casual study. While the wider scope of this work may be beyond the realm of medicine and lead into the field of the social sciences, the essential medical character of all industrial health problems and the necessity of medical guidance in their solution should be a focal point in our deliberations. It is necessary that we view in this light the impact of interests whose approach to these problems is from fields other than medicine.

Industrial health is part of the so-called human factor in which so much interest has been displayed in the past thirty years. Early reforms in this field were made on a purely humanitarian basis and not on the basis that industrial output would increase, and health and happiness also. The attitude of industry and industrial technics have changed. There have developed the speeding up process, the growth of repetitious work at the expense of heavier work, social changes, altered

conditions of work and different types of workers. To date the medical and health functions of the United States have been divided among a multiplicity of departments, bureaus and federal agencies. Since 1875 the American Medical Association has urged the establishment of a single agency in the federal government under which all such functions could be correlated. Such a department would be an effective means of coordinating efforts to improve the health of the industrial worker.

The Council on Industrial Health has been assigned the task of developing an effective program to improve standards of industrial and compensation practice. It has expressed the belief that an important factor in the successful accomplishment of such a program is the development of cooperating agencies in the constituent associations and extension therefrom into the county medical societies. During the past year, committees on industrial health have been organized in most state associations and in several county societies. It is hoped through these agencies to acquaint the Council on Industrial Health with developments in the state and county associations with particular reference to problems of industrial health, and conversely to convey to the committees information about activities and policies of the Council. A means is thus provided also for the interchange of experiences between state committees. Through the agency of these committees, groups interested in industrial health may make a definite impact on the educational programs of their local associations. The excellent program which has been arranged under the auspices of the Chicago Medical Society is a splendid example of the type of educational effort which may be stimulated. Such committees should also define the problems which serve to obstruct the utilization of medical knowledge in the care of the industrial worker. These committees may well concern themselves with the application of the general principles governing the relationships between full-time industrial physicians and the general practitioner.

Vocational Rehabilitation in Relation to Medical Practice and Workmen's Compensation Procedure

MR. TERRY C. FOSTER, Washington, D. C.: Vocational rehabilitation means the rendering of a physically disabled person fit to engage in employment and his placement in employment. It had its origin in the realization on the part of workmen's compensation officials in several of the states that

the payment, to a worker disabled in industry, of compensation for his injury did not solve the problem of getting him back into employment and self support following recovery. By 1918 a number of the states had established vocational rehabilitation divisions as an arm of their workmen's compensation agencies, the purpose being to retain and thus return to employment in new jobs those who through industrial accidents had been deprived of their former jobs.

In 1920 the Congress established a national program to be carried on through the cooperation of the states. This national program is now functioning in forty-seven states, the District of Columbia and the territories of Hawaii and Puerto Rico. Each of these cooperating states and territories maintains a staff of from one to thirty rehabilitation workers whose job it is to find and return disabled persons to employment.

The service operates in about this fashion: When the name of the disabled person is reported or he himself applies to the state rehabilitation service, a case worker is assigned to assist him in working out his problem. The first step taken by the case worker is to secure a rather complete body of information concerning the disabled person and his situation as to (1) his physical condition, (2) his mentality and educational status, (3) his personality—i. e., his ability to get along with others, willingness to work, reliability, and so on, (4) his vocational experience and aptitudes and (5) his life situation—i. e., his family responsibilities, resources and the like. When this information has been collected it is analyzed and a rehabilitation diagnosis is arrived at, an employment objective is selected, and the ways and means of preparing him for and getting the disabled person into the employment selected are worked out with him.

In preparing him for employment, one or more of several services are provided for him, such as physical restoration, an artificial appliance and a special course of vocational training or, in some instances, finding a suitable job may be all that is necessary. But, whatever the services needed, I would emphasize that we stand by him until he is vocationally "well" again or demonstrates that he cannot be made vocationally "well." Naturally we get hold of many cases, just as do you, that cannot be rehabilitated even after our best efforts have been expended and, as do you, we make mistakes. Sometimes you get hold of some of our mistakes, sometimes we get hold of yours, and both of us get hold of the mistakes made by the workmen's compensation commissions.

It is my earnest hope that we can work out a plan by which vocational rehabilitation and workmen's compensation officials and the medical profession can work more closely together in dealing with disabled persons who stand in need of our respective services. Our common job in dealing with persons disabled in industry is to restore such persons to employability and employment. Under this concept it is the job of the medical profession (1) to restore these persons to their maximum physical efficiency, (2) to aid in maintaining their morale by advising them to apply for vocational rehabilitation if they are found to be vocationally handicapped (such advice should be given early in their treatment rather than at the end of it) and (3) to advise with the rehabilitation service and with the compensation officials on the medical aspects of restoring them to employment.

In dealing with certain types of disability, such as tuberculosis, vision, hearing, and cardiac disabilities, the vocational rehabilitation official relies almost entirely on the counsel and advice of the physician in determining the practicability of undertaking the rehabilitation of such cases and in determining the plan by which the individual is to be retained and placed. Likewise, workmen's compensation officials must depend largely on medical advice in the evaluation of the disability and hence the amount of compensation to be paid. I should like to assign to the medical profession a fourth job in dealing with the disabled: that of completing the job of establishing valid and reliable criteria for the evaluation of physical disability. Not only do rehabilitation and compensation officials need such criteria, the courts need it.

Unfortunately the job of the Workmen's Compensation Commission in dealing with persons disabled in industry is too often conceived to be only that of establishing the degree of disability and of paying out the benefits in accordance with

the evaluation. Under the concept which I have stated, their job goes somewhat beyond the simple task of paying out benefits: 1. To see that the disabled person who needs it is given the opportunity of vocational rehabilitation. 2. Within the limits of their discretion, to see that the money paid to the disabled person shall be used as far as practicable in restoring him vocationally and hence to economic self support. In far too many instances, lump sum settlements and commutations are made without any apparent attempt to see that the money paid out will result in his economic reestablishment. 3. To seek, through amendment of those acts needing it, to remove the injustice caused by the so-called second injury clauses. The effect of these clauses in all but a small number of workmen's compensation acts is practically to make it impossible for a disabled person to secure employment in industry.

The job of the vocational rehabilitation service under our conception of joint responsibility for restoring the disabled to vocational competency is outlined as follows: 1. To organize and maintain working relations with them in such way that in every case the combined counsel of the doctor, and the compensation and rehabilitation officials will be brought to bear on the problem of reestablishing the disabled person vocationally, from diagnosis to rehabilitation. 2. To plan and carry out the rehabilitation of the individual on the basis of this combined counsel and understanding rather than on the basis of his own judgment independently arrived at, as is now the case in far too many instances. I have observed over this country thousands of instances in which rehabilitation workers have undertaken the rehabilitation of disabled persons without any attempt to secure medical advice or to utilize the assistance of the workmen's compensation office. Such practice in most instances is inexcusable and frequently results in the futile expenditure of money. 3. To operate the rehabilitation services in such a way that a fair proportion of the number of disabled persons served will be selected from those disabled in industry. The vocational rehabilitation act as originally conceived was intended to cover only those persons disabled in industry. As passed, however, it includes persons disabled from any cause. Unfortunately, in a large number of states, persons disabled in industry are not receiving the consideration contemplated by the sponsors of the legislation. It is high time for industrial surgeons and workmen's compensation officials in such instances to insist that the industrially disabled shall receive an equitable share of service. If our three groups can be brought together and given a common basis of understanding of what we are trying separately to do for the disabled, we should be in better position to coordinate our efforts and thus make fewer mistakes with those cases in which we are all concerned.

To effect this closer working together of the medical profession, workmen's compensation and rehabilitation officials would require joint action by the national organizations of the three groups. This action would probably take the form of the appointment of a representative from each of the three groups. The committee of three thus constituted would draw up a statement of the objectives and a proposed procedure. At the next meeting of each of the organizations the plan could be presented. If approved, the committee would be instructed to proceed to carry the plan into effect. The final form of action would probably be the publication of a joint brochure setting forth what the three groups stand for separately and jointly with regard to standards, procedures and practices in dealing with the disabled. If we believe that the three groups should work more closely together, let's say so and tell the members of our respective groups why and how it can be done. I should like for you to give consideration to my proposal. If you feel inclined to agree with me and wish to do something about it I would welcome the appointment of one of your members or officials to confer with representatives of rehabilitation and workmen's compensation.

DISCUSSION

DR. H. H. KESSLER, Newark, N. J.: The notion was long ago discarded that because a man is suffering from some specific physical defect he is necessarily disabled vocationally. The important thing is to minimize that defect by appropriate treatment. In that respect compensation laws are defective, in that the allowances for medical services are frequently limited so

that ample and adequate treatment is not permissible. In that respect, compensation laws should be adjusted to provide unlimited services, so that the ultimate rehabilitation of the individual is assured. So physical restoration is the fundamental purpose of this whole rehabilitation procedure.

I am sorry that Mr. Foster didn't describe the machinery of the relationship between the federal government organization and the various state agencies. The federal government assists these agencies by providing funds. Each state appropriates a certain amount of money, which is matched by the federal government, and the combined moneys are expended for this total program. There are few states, however, that practice a physical restoration program. New Jersey, fortunately, adopted this procedure from its very beginning and has continued to operate on the philosophy that the first and vital step is physical restoration, and to that end it has created and developed and operated five rehabilitation clinics. These clinics are associated and operated conjointly with the Workmen's Compensation Bureau, so that when individuals are examined for their compensation claims they are automatically referred to the rehabilitation clinic by the state physician who makes the compensation examination. In that way a close cooperation is set up immediately. The individual is referred to the director of the rehabilitation clinic, who makes an appraisal and also decision with respect to the necessity for further treatment, so that the individual gets the benefits of having the maximum amount of physical restoration achieved before any vocational training is instituted, and we find that from 75 to 80 per cent of the individuals who carry through that program require no vocational training. It is a very expensive and unique procedure to take an individual who is over 40 years of age and attempt to train him in a new occupation and change his habits. We have to be very careful in evaluating the mental and physical qualifications of these individuals. The federal government, in defining too rigidly the scope of procedure, also limits the possibilities of rehabilitation in the various state agencies. They could be very much more liberal in providing funds for the physical restoration or at least in matching funds that were provided by the state.

DR. A. S. LEVEN, Chicago: If all the agencies—the medical profession, the rehabilitation agencies, the compensation agencies—were united in doing all they possibly could do to rehabilitate a worker who is permanently disabled, there are still two factors that are a hindrance to this field, namely industry itself and insurance companies. We must educate industry and we must educate insurance companies to this major problem. Industry has not as yet recognized the obligation to the injured workman, and the workmen's compensation laws of the various states are still faulty. If we can combine with the agencies, as Mr. Foster brought out, those two who are mainly concerned from the monetary point of view, then we, as physicians, can go on record to help this cause along.

DR. EARL D. McBRIDE, Oklahoma City: I think that Mr. Foster has hit a keynote. I would suggest, in order to carry it out efficiently, that the vocational and rehabilitation department in each state have authority to pass on the permanent disability cases in respect to vocation before the settlement is actually made. On account of the system we have, the present commissions are so busy taking care of the cases that come up for adjustment and award that the vocational part is often forgotten. Men may be paid off in lump sums and, as he has suggested, squander their money. The employer, represented in court oftentimes by the attorney of the insurance company, has his own interests to look after. The claimant, perhaps, is anxious to have the award made for his own benefit and thinks little of the future. If there were established in the vocational and rehabilitation department a medical authority who would impartially pass on the prospects of this man who is permanently disabled with regard to his future rehabilitation and employment, and this word could be passed to the bureau or to the commission of the industrial board, then it seems we would get somewhere with respect to the principles Mr. Foster has brought out.

MR. TERRY C. FOSTER, Washington, D. C.: Dr. McBride has hit what I think is the keynote in the whole thing, the bringing of the doctor into the evaluation of the whole program in which the individual is involved. I might say that we are only waiting for the medical profession to complete its job of setting up

criteria for the functional evaluation of the disabled person after maximum correction has been made. I have already worked out with members of the medical profession a series of forms on which the doctor is to record his observations in the examination of disabled persons. As soon as the criteria for the evaluation of disability are completed, I think it won't be difficult to bring the two together, so that the doctor will have greater influence in the final disposition of the cases we serve.

A New Frontier in Medicine

DR. LYDIA G. GIBERSON, New York: Psychiatry, which once was merely custodial in its function, has passed through a difficult therapeutic stage and has reached the full stature of preventive medical technic ready for mass application. When the United States entered the World War, there was brought about the first application of mass psychiatry in world history. For the first time the scientific explorer could see the inception, the progress and the closing phases of a mental ailment, and for the first time he had the authority and the numerical scope with which to control his data and reach reasonably accurate conclusions. The moron and his incidence became nationally known. "Shell shock" and "rehabilitation" became understandable words in the vocabulary of every intelligent American. Many of the tabus surrounding the mentally unfit were shattered and, as a by-product of a social upheaval, psychiatry became therapeutic and not merely custodial.

In the postwar period, psychiatry became, by a series of literary accidents, a most unfortunately popular subject. Under the popular acceptance of Freud, Adler and Jung, mental ills became matters of common conversation. Psychiatry, in this middle period, came closer to being scuttled by popular enthusiasm than it ever had been in the earlier period by lack of opportunity to experiment. This earlier journalistic phase soon settled to the seriously restricted area of the psychiatrist's office. As early as 1916, psychiatrists became aware of the tremendous possibilities inherent in the masses of industrial workers. There was a field in which the conclusions one reached might be put to work to prevent sickness.

In 1917 and 1918 the late Dr. Elmer E. Southard interested the Engineering Foundation in the possibilities of a psychiatric approach to industrial personnel problems. In a survey in 1920 he found that 62 per cent of more than 4,000 cases observed reached the discharge status through traits of social incompetence rather than occupational incompetence. In 1922 the Metropolitan Life Insurance Company started a full psychiatric service for their employees, a service which continues to the present day. Later, in 1924, Macy's Department Store in New York, employing about 9,000 persons, began a psychiatric investigation which today serves as a research department.

The next major impetus came from industrial personnel groups in 1932 when they began to apply psychologic concepts to their perennial problems of labor turnover and labor placement. Safety workers and other industrial control groups have altered their procedures to allow for psychiatric techniques. The progress from 1934 to 1940 has been a slow one of group education. Thus psychiatry has moved slowly away from the fashionable patient who alone could afford a two year treatment for real or fancied mental ailments. Slowly the mists created by novelty and jargon have lifted. The medical facts have emerged. Psychiatry can now open its new development in a great industrial laboratory where, by honestly sympathetic application of its principles, mental sickness may be not merely detected but prevented.

Workers are torn by two, often opposed, social systems; in his home and in his church he is a part of the century old compulsions which demand a unity of attitude if he is to attain happiness; in his factory he is in another world curiously inadequate and incomplete. Monotony produces the accident-prone and the maladjusted worker. Mental factors account for some 85 to 90 per cent of industrial accidents. Personnel workers have been investigating with the aid of psychiatrists the emotional causes of absenteeism and of friction among their employees. Industrial relations experts have been concerning themselves with the psychology of conflict in their attempts to get at the sources of trouble before it mushrooms into ugly proportions. Social workers have found that many of the complaints they hear are based on emotional rather than physical environments.

DISCUSSION

DR. CLARENCE D. SELBY, Detroit: Despite the fact that the industrial surgeon of thirty years ago has evolved into other specialties, such as industrial medicine, industrial hygiene and now preventive medicine, there is need for further evolution. The industrial physician today must become to some degree a psychologist, and you can readily understand why. Industrial physicians speak rather glibly of safe placement of employees or suitable placement in occupation and make a rather complete physical examination, but we do not examine the man himself. May we consider for the moment man as an automatic machine? But we, by the same token, completely ignore the mind of the man who is back of that machine. I recognize that the industrial physician has no responsibility toward the disordered mind unless that disorder results from occupation. The treatment of cases of that nature are the right and purpose and the obligation of the general practitioner. The physician in industry has no intention or right of depriving him of that privilege. Nevertheless there is a constant stream of employees flowing through the medical service, usually equivalent to the number of employees on the payroll each month, who have stories to tell to the physician. They may be expressions of a purely normal individual, or expressions of a disordered mind. So far as the physician in industry is concerned, it seems to me they are largely expressions of worry, and Dr. Giberson has brought that out in her paper. The men out in the plant just naturally gravitate into the medical office for the purpose of telling something which has no relationship to employment and is of a purely personal nature, but they must tell somebody and they look on the doctor as the one to whom they can tell that. If the medical profession can utilize that tendency of the worker to relieve these sources of worry by psychologic methods, if you please, the industrial physician will be in a vastly superior position with respect to his ability to serve the employee group. That might be classified as counsel or service. I am completely at a loss to know just how to evaluate these worries that come across the desk to me. I should like to have the psychologist put down a series of rules that would tell me how to proceed, something practical that will permit us to render the service that we wish to render but do not know how to do. There is another phase to psychology in industry that is very important but at the moment I believe beyond our ability even to comprehend, and that is what might be called man evaluation at the time of employment. We are able to examine the workman physically but we haven't the slightest conception of what we should do to find out what type of work the individuals are mentally fitted for. There are many examples. How the doctor can codify those and classify them, put them into categories so he can specify on the report which he sends to the employment department that this man is or is not mentally suited to this job is what we need of the psychiatrist.

DR. L. D. BRISTOL, New York: I should like to emphasize one phase of this subject in developing the discussion of Dr. Giberson's paper, and that is not only our responsibility as industrial physicians with reference to these problems as they pertain to the employer but our responsibility in educating management itself to the place of mental hygiene and the use of at least part time psychiatrists in the industrial health program. The average representative of management thinks in terms of custodial care and actual cases of mental disease, and that the psychiatrist is only interested in that aspect of the problem. He has shied away somewhat, as the executive, from this whole subject of mental health and the services of the psychiatrist. We must emphasize to management how the physician specializing in this field can be of assistance to him. I had the privilege of attending the Personnel Section of the American Management Association. What were they talking about? They were discussing What is the employee thinking about? What is he worrying about? What can we do to help him be satisfied with his job? We as industrial physicians should bring to the attention of the personnel director the fact that bad employee relations are very largely a matter of bad mental hygiene and that perhaps if he will avail himself of the services of not only his own physician in his organization but possibly the part time services of a psychiatrist he can do much to prevent these conditions he is talking so seriously about in his personnel meetings.

DR. LYDIA G. GIBERSON, New York: Dr. Selby has probably given you a much better psychiatric approach than any psychiatrist could, because he has been, for many years, practicing what I am trying to preach. I should like to tell Dr. Bristol, in all fairness to industry, that I believe management itself is headed for the doctors. Since 1938 I have had personally twenty inquiries from management groups to one from a medical group. I should like to mention the American Management Association. I think it was in 1926 that I was the guest speaker at the American Management luncheon, and for that one luncheon the personnel management group chose the subject of psychiatry. In Chicago on November 30 the Industrial Relations Association also had this subject featured. So I believe it is up to us as doctors to go out and do something about this. In closing, I would like to emphasize that before you can be a good psychiatrist you must first be a good doctor.

Adequate Nutrition for the Industrial Worker

LELA E. BOOHER, PH.D., Washington, D. C.: This paper was published in full in THE JOURNAL, February 17, page 548.

DISCUSSION

DR. MORRIS FISHBEIN, Chicago: I have been asked to discuss this paper probably because I am Chairman of the Council on Foods of the American Medical Association. The Council on Foods has been greatly concerned about practically every aspect of the subject as Dr. Booher presented it to you. I have recently reviewed a book published by the Department of Agriculture called "Food and Life." I suppose in that book we have more information about food and its distribution and the needs of humanity in the United States than is probably available anywhere else. The main problem, as I see it, in applying this material to the worker in industry is that workers in the United States are scattered through forty-eight different states and innumerable cities and villages and under all sorts of social and economic conditions. They are not easy to educate in the matter of food and not easy to educate with scientific material given away by the government and by educators. At the same time, commercial agencies of one type or another are endeavoring to educate them at considerable expense and have much more influence and much more experience in education than the scientists have generally. The material you hear over the radio as to what you can buy for a certain amount of money and what you ought to eat is what really educates the children of the United States and the workers regarding diet. In analyzing the statistics regarding the extra feedings of the worker in industry, I have always been concerned with the fact that the worker in industry has as many different considerations disturbing him as the person who is buying food for the home. Sometimes we forget that fifteen minute rest periods at two hour intervals will also enable him to turn out more work and probably better work than an extra glass of milk every two hours. Sometimes we forget that, if you give him a little more light to work with, and better light, he will suddenly start turning out more work. Sometimes changing the ventilation, the chair on which he sits, and all sorts of changes affect every one of these experiments. I suppose it is up to the industrial physician to work out a suitable program for testing the relationship of diet to the worker's output and to his general health. A single important observation of the type of that having to do with sodium chloride intake for the worker under conditions of excessive heat is worth any amount of effort that the industrial physician or any one else may care to put on an experiment of that sort. Dr. Booher has given a fine statement of standards and of the present status of knowledge on the relationship of nutrition to industry. It might be well if the Council on Industrial Health could take up the question of how to get management and the workers themselves to pay more attention to the knowledge we now have. It is primarily an economic problem for workers in the low income levels. For workers in the higher income levels it is a problem of education. American workers spend for themselves and their families about 30 per cent of their income on food. With 30 per cent of their income they ought to be able to get a fairly good standard of nutrition. The translation of what we know, for the worker, into a language he can understand is also exceedingly important. All together, we have a great problem in how

to control advertising of food products, which the Council on Foods is endeavoring to do and, second, to get knowledge over to the worker in a language he can understand.

DR. L. D. BRISTOL, New York: I should like to indicate something with reference to the practical application of a nutrition program in industry. First of all, it should be the function of the industrial physician to keep these facts of malnutrition and adequate nutrition in mind in dealing with the individual employees. Some companies see fit to go into the question of extra feedings. Other companies have preferred to emphasize the educational aspects of this whole problem. During the last ten years, as a follow-up to our regular health course, for women particularly, we have been carrying on a so-called nutrition course under the guidance of a trained nutritionist. We have already had something like 10,000 women employees who have been graduated from a ten lesson nutrition course, a purely voluntary course given on the employees' own time, with trained instructors and the necessary textbooks. While as yet we haven't been able to measure results from the standpoint of efficiency or decreased amount of sickness or improved positive health, we have definitely been able to measure the improvement in the choice and selection on the part of employees when it comes to their food, particularly in our cafeteria. In all of our companies, all of our offices have a lunchroom or cafeteria, and it is possible for us to judge the demand on the part of employees for certain articles of food. Previous to this health course we know that, particularly during rest periods, the employee would go to a counter and get some chocolate candy and a soft drink. We have been able to determine that as a result of this nutrition course for employees a great increase has taken place in the demand for milk and green, leafy vegetables. That is one way of measuring nutrition education. The very fact that they are selecting a better type of food is a positive way of getting at this subject. I am not so much in favor of management trying to add extra feedings. I think that, if anything, we should educate the employees to do this thing from their own standpoint and see that they get three better meals a day. We found that among our employees breakfast is nothing but a sip and run meal, if you will, a hurried cup of coffee grabbed on the way to the office. We know that lunch is frequently nothing but a very poor sandwich and a cup of tea. So much of our educational work for employees involves three satisfactory meals a day, with the hope that the employee will take these things to heart and that, in the long run, it must improve his health.

DR. LELA E. BOOHER, Washington, D. C.: Something Dr. Fishbein mentioned makes me a little worried about those tables I gave you. I hope you are going to keep those in your office and use them as your source of knowledge, to communicate and translate to the worker. It makes a chill run down my spine when I think it might be handed to industrial workers who would be confused about it all. Certainly, teaspoons and bottles of things are what the average person thinks about when he thinks of quantities. We answer about fifty letters on foods and nutrition a day, and the questions are amazing. They want the government to cure every disease they can possibly think of. Diets for different diseases are thrown in at us, until we have worked out a form letter in which we just change the name of the disease they have asked about and refer them to their physician. It isn't possible to give help *en masse*. That individual problem is there in nutrition, as it still is in medicine.

JANUARY 15—AFTERNOON

DR. WARREN E. DRAPER, Washington, D. C., in the Chair

SYPHILIS IN INDUSTRY

Syphilis in Industry, with Special Reference to Its Incidence and Relation to Trauma

DRS. EARL D. OSBORNE, HERBERT L. TRAENKLE and FRANK A. DOLCE, Buffalo: The importance of syphilis in industry was recognized long before there was any thought of the present campaign against syphilis. Studies on isolated industries, such as Stokes and Brehmer's on railroad workers in 1920, had awakened the realization in the minds of executives of some corporations to the responsibilities of management in the control of syphilis. It was only natural, therefore, that in the public health campaign against syphilis, begun in 1935, organized industry should present a fertile field for an intelligent attack.

Stokes, Beerman and Ingraham have recently summarized the various studies on the incidence of syphilis in industry from 1920 to date. When the campaign against syphilis was instituted in Buffalo, in August 1935, it was apparent that in any approach to the problem of syphilis in industry in a large industrial city, a determination of the incidence of the disease in industry generally was absolutely essential. With this in mind, the director of syphilis control of Buffalo began a survey of all blood serologic tests performed in the laboratory of the department of health of Buffalo from the industrial concerns throughout the city.

During the first two and one half years of the survey, Jan. 1, 1935, to July 1, 1937, males in general industry showed 6.7 per cent positive tests and females 5.9 per cent, or a combined percentage of 6.6. During this same period there were 6.1 per cent positive tests in food handlers and 4.6 per cent positive tests among patients seen by private physicians. During the last six months of 1937 and the entire year of 1938, 2,500 additional routine serologic tests were performed on the bloods of industrial employees. Probably as a result of the intensive campaign against syphilis, the percentage of positive tests dropped to an even 5. If from these figures the tests performed on Negroes are subtracted, the final result is approximately 5 per cent positive during the initial period of 1935 and 1936 and the first half of 1937, and 4 per cent during the second period. In 1938 the number of early or new cases of syphilis in the entire city dropped to approximately one third the number reported in 1935.

An industry that employs a large percentage of individuals in the age group from 18 to 30 may expect a relatively high incidence of early syphilis. An organization that employs a large percentage of individuals in the age group from 30 to 40 may expect relatively few cases of early syphilis and a high preponderance of latent syphilis and early cardiovascular and neurosyphilis. An industry with many employees of long duration in the age group over 40 may expect a high incidence of late cardiovascular and neurosyphilis. It is important for industrial physicians to know and appreciate which type of late syphilis may be expected to affect operating efficiency and to present the greatest hazard from the standpoint of injury to the employee and the public.

With these points in mind, it was advantageous to survey a large group of industrial workers examined at the Edward J. Meyer Memorial Hospital. Four thousand and six individuals were examined. As the patients of this hospital are mostly unemployed or in the lowest income group, it was desirable to survey a similar group of industrial workers seen in private practice who also had syphilis and had received a thorough physical and serologic study. Of 399 workers in the "heavy" industries, with syphilis, less than 7 per cent presented early syphilis. Among the workers in the "light" industry group, the percentage of early syphilis was 23.8. The discrepancy emphasizes the necessity for periodic examinations and serologic tests on the workers in the so-called light industries. In the heavy industry group 18.5 per cent showed evidences of neurosyphilis and 29.9 per cent of the workers in the light industry group were found to have neurosyphilis. Clerks, skilled workers and railroad employees with asymptomatic and late neurosyphilis can account for a large amount of lowered operating efficiency, direct monetary losses and accidents involving the public, the fellow workers and themselves. In the heavy industry group 13.5 per cent showed evidences of cardiovascular syphilis, whereas in the light industry group, in which physical stress is reduced to a minimum, only 5 per cent showed evidences of cardiovascular syphilis. Our observations on patients developing aneurysms and aortic regurgitation as a result of trauma or severe exertion while employed in heavy industries indicate that each case costs the industry some five to ten thousand dollars. The detection of syphilis in heavy industries, where it is largely neglected, is therefore of definite practical economic value to the industry itself as well as to the employee. In the combined groups of the food handlers, seventy-seven had syphilis and thirteen had manifestations of early or infectious syphilis. If it is desirable to detect early infectious cases among food handlers more than it is among other groups, and we doubt that it is, a routine serologic test, performed every three to six months, cannot be expected to pick up more than 25 to 50 per cent of the infectious cases during the first week

of their existence. If compulsory serologic tests are performed on food handlers with the idea of protecting the public from infection, we believe that the entire plan is wasted effort. We have never seen a case of syphilis transmitted by food handlers or, for that matter, by clerks or barbers meeting the public, through intermediate contact with plates, glasses, cups, vegetables or fruits. The greatest danger from these individuals is the transference of the disease to other employees and to patrons of the establishment through the usual method of sexual intercourse. It would be more to the public's benefit to have laws requiring the compulsory physical and serologic examination of employees of all public transportation companies.

We have reviewed our cases of syphilis complicating trauma. These cases are listed under the following diagnoses: (1) surgical incision in preexisting periosteal gumma; (2) nodulo-ulcerative tertiary syphilis occurring at site of recent injury; (3) fracture at site of preexisting osseous gummas; (4) periosteal gumma following a blow on the tibia; (5) osseous gummas of the skull following a blow on the top of the head from a timber; (6) interstitial keratitis following an injury to the cornea from a foreign body in congenital syphilis; (7) interstitial keratitis after a burn of the cornea from hot solder in acquired syphilis; (8) dementia paralytica following a severe head injury; (9) dementia paralytica following prolonged surgical anesthesia; (10) dementia paralytica following high temperature from streptococcal infection; (11) aortic aneurysm following heavy physical exertion.

In analyzing these cases, the following conclusions were apparent. 1. The average cost of each case to the industry was exceedingly high. 2. The proper syphilis program in each industry involved would have prevented syphilis from being a factor in any case. 3. No cases of syphilis complicating trauma have been seen by us in plants having an adequate syphilis program.

We submit the following suggestions regarding a syphilis program in industry:

1. Establish routine preemployment physical and serologic examinations and periodic reexaminations of all employees. This should include executives, clerks and skilled workers as well as the purely physical workers.

2. Sponsor refresher or postgraduate courses in syphilology for members of the medical staff and make adequate consultation and supervisory services available.

3. Become acquainted with the following scientific facts: (a) the danger of transmitting syphilis in industry from direct or indirect contact (tools, drinking cups, door knobs, toilet seats) is absolutely minimal and the factor of least importance in the control of syphilis in industry. (b) The positive serologic test is no criterion of infectiousness and should be interpreted only by a physician on the basis of a complete physical examination and determination of type or kind of syphilis present. (c) The positive serologic test or its degree of positiveness is no measurement of the stage or seriousness of the disease or effectiveness of treatment. (d) The negative serologic test without physical examination is open to the same criticism as is the positive test. The highly infectious primary lesion is not accompanied by a positive blood test during the first four to ten days of its existence and an appreciable percentage of individuals (5 to 10, depending on the laboratory technic) with late syphilis have negative blood tests. This fact together with the necessity for discovering newly acquired infections among old employees is the reason for periodic reexaminations.

4. Based on a knowledge of the foregoing facts, an enlightened policy toward prospective and old employees should include: (a) Rejection only of those syphilitic employees who show evidences of damaging late syphilis or early infectious syphilis. (b) Insistence on complete physical examination, including spinal fluid examination for all employees found to have syphilis. (c) Insistence on adequate modern treatment with supervision by a syphilologist if indicated in special cases. (d) Transfer of employees with cardiovascular and neurosyphilis to positions entailing no hazards for themselves, their co-workers or the public. (e) Dismissal only of those syphilitic employees who refuse to cooperate. There is nothing more unjust than the blind dismissal of an employee because of a positive Wassermann reaction. With cooperation and proper treatment, the industry will gain a loyal employee and take on

no increased hazard. (f) Maintenance of strict confidential relationship between employee and company physician. (g) Cooperation with local health authorities in reporting and tracing the shifting or migrating worker with syphilis.

For industrial physicians and surgeons:

1. Become conversant with published data regarding the direct and indirect cost of syphilis to industry in general and your own plant in particular. Use this knowledge in "selling" your company executives on a proper modern syphilis program.

2. Improve your own knowledge about syphilis with postgraduate courses and secure adequate expert advice and guidance from a qualified syphilologist.

3. Cooperate with the local public health authorities in tracing "contacts" and itinerant workers with syphilis, and also in the elimination of houses of prostitution from the neighborhood of the plant.

4. Keep a complete record of the physical examination and treatment of every syphilitic employee. Check his treatment with the recognized published systems of treatment indicated in his case (early, latent, liver, cardiovascular, skin, bone, special sense organ and neurosyphilis). Insist on consultation with specialist where indicated so as to check up on the adequacy of treatment.

5. Don't be satisfied with a diagnosis of syphilis. Insist on knowing the kind or type of syphilis and the degree of damage, if possible, in the principal organs involved.

6. Remember that late cardiovascular syphilis is from two to three times as common in workers doing heavy physical labor as in those performing jobs requiring little or no physical strain. Remember also that neurosyphilis is almost twice as common in executives, clerks and skilled workers as in "heavy" laborers.

7. Remember that all persons with syphilis, unless it is contraindicated by old age or general debility, should have a spinal fluid examination. Approximately 15 per cent of the workers with "latent" syphilis will be found to have a positive spinal fluid.

8. Remember that persons with cardiovascular and neurosyphilis require specialized treatment from the beginning.

Syphilis Case Finding in Industry

DR. ALBERT E. RUSSELL, Chicago: This article will be published in full in THE JOURNAL.

Integrating Syphilis Control Between the Industrial and the Private Practitioner

DR. HAROLD A. VONACHEN, Peoria, Ill.: With the acceptance of a syphilis control program by industrial organizations, the medical divisions assume responsibilities which require conscientious administration of a very definite routine. The various plans of syphilis control programs differ little in the main, with slight variant in detail. The most perplexing problem seems to be the method of approach to the family physician. The relationship between the family physician and the industrial physician must be based on honesty of purpose always in the light of past experiences. The industrial physician needs the aid of the family physician in his care of compensation cases, while the family physician requires the good will of the industries medical division in the reference of non-occupational cases. The family physician must be convinced that never will the medical division of industry render treatment in cases of syphilis. When a worker is informed of his syphilitic condition, he is in need of a friend to give him advice and guidance. If the procedure is attempted by the private physician alone, the employee is likely to think that, because the treatment is long and expensive, he is being overtreated. The plant physician can and does advise the employee that the treatment of syphilis requires time and money and that the family physician must follow the long continuous course of treatment.

In our present plan of syphilis control, the individual, following an interview with the personnel and employment departments, goes to the medical department for physical examination. If the Kahn test is found positive, the employee is given a personal interview with either the medical director or the plant physician and is informed that the blood test reveals evidence of syphilis and that he must present himself to his family physician for a check of his Kahn test. The employee is given ten days to return and, if the results of the blood-test taken by

the family physician fail to agree with the primary test, a specimen is sent to a third and a fourth laboratory. If the blood tests check, the employee is told that the information is absolutely confidential between himself, the industrial physician and the family physician and that absolutely no information has been given to the employment or personnel departments. This is essential, as on it depends the success or failure of the plan.

The employee is then told that he must present himself to his family physician for treatment and that he will be given employment as long as he continues to cooperate. Each month thereafter the employee must present to the medical division a slip signed by the family physician that treatment has been received. A careful check and file is kept so that automatically the medical division knows each person that is expected on the given date to present his slip. If reports from the family practitioner are favorable, the employee continues employment. If not, he is called to the medical division to ascertain the reasons for his neglect and further advice is given and warning as to the necessity of treatment. Continuous neglect calls for dismissal of the employee.

After seventy weeks the family physician is consulted as to the amount of treatment received by the patient. If it is considered adequate he is requested to return every six months for reexamination.

The operation of this plan depends on the type of syphilis that presents itself in the individual. Employees in the primary or secondary stages, of course, are rejected, and also those who have definite evidence of neurosyphilis. There can be no objection to this plan by the family physician, as the cases are referred directly to him for treatment and the only requisite is cooperation in maintaining the treatment for the proper period of time, and he receives only those who are capable of paying, as the others are referred to the state clinics, who are asked to follow the same procedure.

I believe that the industrial practitioner might and should inform the employee of the need of protection and investigation of his family, but certainly the duty of reporting to the state, and the family diagnosis, belong strictly to the family physician.

In my opinion there should be greater unity in fees and a budgeting of the individual's earnings to cover adequately the payments of his treatment. The fact that an individual is given employment with the understanding that treatment is necessary should guarantee the treating physician his fees. The details of a syphilis control program are unimportant if it provides adequate treatment and allows the employee to continue his God-given right to earn a living for himself and his dependents.

Syphilis and Employment

DR. HARVEY BARTLE, Philadelphia: Our sympathy is aroused for afflicted persons and it becomes the primary motivating factor in rendering all possible assistance to restore health to these unfortunates. The humane reaction is the dominant factor in the restoration of optimism, health and happiness to these persons. In major industries there is a familial relationship between employer and employee; consequently industry becomes morally obligated if not otherwise to the workers. It is not simply a moral right to relegate to the state as a charge or beneficiary known infected persons. There are other avenues open for successful rehabilitation, preferably accomplished through the maintenance of earning power. To do otherwise would in many instances produce a disgruntled citizen.

Social and economic factors of employment lead to the impression that industry has an obligation to society in not refusing employment to any one without good and sufficient reasons, thus creating unwarrantedly a group of unemployed and unemployable persons. The present day emphasis on social security in its blanket approach surely will not condone the exclusion of any group indiscriminately when there is a way out, reasonable and fair, and with a minimum of industrial risk if properly supervised. This responsibility is difficult to evaluate in the case of the syphilitic because of the varying physical and mental impedimenta. Every trained artisan is a capital investment and any personal handicap is disturbing for many reasons.

What advice is it possible to give to industrial management about the advisability of arbitrarily refusing employment to all known syphilitic applicants? The well informed physician in

industry can allay any perturbation about the transmissibility of the disease in the industrial environment. He cannot be quite so reassuring about the purely economic considerations which have to do with slowing up production, absenteeism, proneness to accident, and neurologic and mental changes with their consequences. Industry has little evidence on which to base a policy of discrimination against applicants who are known to have syphilis or the dismissal from service of persons who acquire syphilis after employment. Do not misunderstand this pronouncement. There must be some protection to the employer as well as to the employee. The modifying factor is the status of the disease.

Syphilis of the central nervous system is a real industrial medical problem. Persons in this category who sustain slight trauma may have more serious aspects of the disease precipitated. From the neurologic angle are frequently seen tremors, changes in sensation, disturbance of locomotion and incoordination, which are obviously handicaps of varying degree. If persons with these manifestations are retained in the service, special placement and supervision are certainly needed to protect the individual and as a general safety measure. Pathologic structural changes in heart and blood vessels are susceptible of various interpretation. They are admittedly fraught with potential danger from the standpoint of sudden incapacity. The manifestations of the disease are the criteria on which the disposition of the afflicted persons on an employment status must be predicated.

What then is the advisable thing to do from a medical point of view? The following postulates may appropriately express the present generally accepted opinions operative as a guide in personnel planning by industry:

1. A person having had an initial lesion or congenital syphilis, with or without a positive blood Wassermann reaction, may be accepted as a new employee.
2. A person with an open lesion should not be accepted.
3. A person with a positive blood Wassermann reaction and not under proper, safe and adequate treatment should not be accepted unless it has been definitely established that the individual is Wassermann fast.
4. Those having pathologic changes of the heart and vascular system of a precarious nature should not be accepted or permitted to work, even if the person should be under medical supervision.
5. Persons with advanced pathologic changes in the bony structures are a menace in any work and should be guardedly employed.
6. Those having pathologic changes in the brain and spinal cord should not be accepted and those in active service should be relegated to placements of safety with periodic examinations.

DISCUSSION ON SYPHILIS IN INDUSTRY

DR. HUNTINGTON WILLIAMS, Baltimore: There will be little disagreement with Dr. Osborne and his co-workers on the matter of the lack of necessity for syphilis tests for milk and food handlers and other special groups. It is often the duty of the medical director in industry to try to persuade the head of the industry that that is so. Drs. Osborne, Traenkle and Dolce hit a keynote in the emphasis we must all put on the terrific cost of syphilis in and out of industry. The geographic location in the country has a big effect on the amount of syphilis present in the community. Dr. Russell gave us some statistics. Magnificent work has been done in Scandinavia, but I am a little leery of statistics. Sir Arthur Newsome told us that when dealing with statistics you should treat them like sausages: who made them, out of what they were made, and for what purposes they were made. When I prepared the first paper I ever gave on a health topic I went to the director of statistics in the state health department in Albany and asked him for some figures on tuberculosis. He said "Doctor, what side of the argument are you on? If you are against it, I will take it out of this pigeonhole, but if you are for it I will take it out of this pigeonhole." Dr. Vonachen and I agree that syphilis records ought to be confidential. What is confidential? It is confidential between three or four people. Why not add a fifth? I would, as a health officer, disagree with him when he says that the industrial director should not report to the health department. In most states

that would be illegal. I agree with practically everything Dr. Bartle said. Dr. Osborne and his co-authors apparently wrote their paper in part around the same editorial by Moore, which is the basis of the plan which we have put to work on syphilis control in Baltimore. I am sure that Dr. Vonachen visualized both the industrial and the private practitioner as part of a larger medical team which includes every physician within a community under a civic and perhaps even a health department banner; a team whose goal is the control of syphilis through a more effective and community-wide application of diagnosis, therapeutics and epidemiology. I believe that case finding in syphilis requires a different technic from that used for most other communicable diseases, and particularly tuberculosis. The epidemiologist in syphilis must work hand in hand with carefully trained social workers in the clinics, and many industrial and family physicians must broaden their vision of community responsibility if syphilis is going to be fought down. Reliable figures on the prevalence of syphilis are difficult to get. Month after month statistics pile up in health departments on reported cases of syphilis, but many of the reports represent old cases that may have been reported at some other time, under some other name or in some other health jurisdiction. There are many duplicates in the reports that go to make 760 times as much syphilis in America as in Sweden. A plan which, during the past three years, has been developed in our city for syphilis control in industry was described in the July 1938 issue of *Baltimore Health News*. It is based primarily on a very striking editorial in the May 1937 issue of the *American Journal of Syphilis, Gonorrhea and Venereal Diseases* and simultaneously in the *Journal of Industrial Hygiene and Toxicology*. The plan emphasizes the truth that the public often seems loath to accept the fact that syphilis spreads relatively rarely except by the sexual route. It also stresses the fact that a positive blood test does not always mean communicable syphilis. The heart of the Baltimore Plan is a written agreement entered into voluntarily by the medical director representing any industrial organization in which application is made for the health department laboratory blood testing of employees and which provides for the reporting and follow-up of positive cases but which includes the very special stipulation that "No discrimination is to be practiced on employees or prospective employees because they show evidence of venereal disease on laboratory tests but are otherwise physically fit for the employment which they have or seek." That is the kernel of the whole plan. It is taken right out of Dr. Moore's editorial. From February 1938 to date, eight industrial organizations in Baltimore employing, roughly, 8,490 workers, through their medical directors, have entered into what I consider may prove to be a most satisfactory community approach to the control of syphilis in industry. In Baltimore we use the serodiagnostic test. We have thrown the word "Wassermann" overboard because we don't use the test any more. If we can get the public to throw the term "Wassermann" overboard I think we would be better off, because usually they misspell it anyway. The Baltimore City Health Department has cooperated with various industrial organizations in our city along educational lines by providing moving pictures, speakers, exhibits and press and radio material on syphilis control in industry. Our particular plan may offer a reasonable and carefully guarded approach to the big problem ahead. It may need modification in some community other than ours. We have found ourselves blocked in a large inter-city industry because the city health department in their home office city makes a practice of taking the blood samples of the industrial employees without cost to the industry. We can't afford to do that. The home office of this industry issued orders that their medical director in Baltimore might not cooperate with our plan, which requires the industrial physician to take his own blood specimens and submit them to our health department laboratory. We shall find an answer on that. Occasionally we find that large interstate industrial units are hard to budge when, on the advice of their medical directors, they positively insist on a policy of discharging employees in certain categories merely on the basis of a positive blood test when the employee is known to be otherwise physically fit for his job. Careless or unthinking members

of the medical profession may also disrupt a smooth working syphilis control program and the equanimity of the occasional medical director in industry. I have a few copies of the written outline of the plan available for you, if you should like to take them with you.

DR. CHRISTOPHER LEGGO, Crockett, Calif.: I speak as a plant physician with regard to adequate propaganda, which adequate propaganda means not too much and not too little. Where a program is in force, where the syphilitic are all known and are handled personally, I feel that the less propaganda, the fewer posters, the less that is brought in, the better. If in a situation such as the fourth speaker describes where Wassermann tests are not routine, I think propaganda might be in order to encourage people to come for investigation. Syphilis can be cured. Syphilophobia can't be cured, and those people suffer more and are more inadequate than the actually diseased persons. The propaganda, if it is directed by a conservative plant physician in whom the person has confidence and is put out by him personally, will attract the attention of the introspective introvert, but the extrovert whom you want to change throws it away and pays no attention.

DR. BEVERLY L. VOSBURGH, Schenectady, N. Y.: In 1932 we started a program of routine Wassermann tests and found at that time about 4.4 per cent incidence. That incidence has gradually decreased until in 1939 it was 1.8 per cent. We pay the local laboratory \$1,000 a year for doing our Wassermann tests. We have to convince the management occasionally that that \$1,000 is a worthwhile investment. We find not infrequently that patients who have repeated positive Wassermann reactions have no knowledge of syphilis whatever. They haven't the slightest idea how they contracted it. It is hard to convince those people that the presence of repeated positive Wassermann reactions is adequate excuse for two years of uninterrupted treatment. The cost of treatment for the patient in our community is about \$5 per treatment a week. Over a period of two years that means roughly \$500, which is quite an item to a man who makes perhaps \$20 to \$25 a week. Some of those people migrate to clinics where they have a pay scale commensurate with their incomes. There are many people in industry who say they do not have a family physician. They don't want to go to clinics, and it is a bit difficult to pick out a physician for treatment. It took us a long time to formulate a policy in respect to syphilis. At first, in 1932, practically all of the people we were examining or reexamining were old timers. We had no difficulty in placing them at work. Even the neurosyphilitic and those affected with cardiovascular lesions were usually safely placed. When it comes to the present time, many of the people we find with syphilis are new employees who have no service. When it comes to the policy in regard to new employees, it is a little different.

MR. VERNE A. ZIMMER, Washington, D. C.: I do not represent labor but in my official capacity I have talked to many labor leaders about this program. I find them sympathetic with this movement to check syphilis but distinctly unsympathetic toward the idea of picking the industrial worker, out of all the groups, as the guinea pig. In a conversation one of the labor leaders of fairly broad national reputation in Washington said "Labor would feel better about this move to examine for syphilis all workers in industry if some other groups would step forward first as an example. Why pick on the worker more than the medical profession? Why pick on the worker more than the chamber of commerce? Why not pick out the church congregations? They are accessible as groups." Labor doesn't believe you can put up a program in industry for preemployment physical examinations for syphilis that doesn't involve general conditions as well. In the main, labor doesn't like the preemployment physical examinations, because it has had bad experience with it. I was interested to hear Dr. Russell mention that point. He said that unfortunately there are employers who immediately discharge or who refuse to hire the man with a plus Wassermann reaction. I have been interested in one item this afternoon, and that is the debunking of the idea that these spirochetes are hopping around and you can get them anywhere, even in the dining room. Labor will be pleased to know that, while it is theoretically possible, it doesn't really happen. Labor would have been interested to hear these com-

ments on cost today. There are several million workers in the United States not averaging \$1,000 a year. How is one of these going to take even \$100 and divert it from his family for treatment for himself? If you are going to emphasize this program with respect to the lower wage groups, there must be more monetary aid from the national, state or local governments. I am secretary of the International Association of Accident Boards and Commissions. In the years in which I was engaged in the actual administration of workmen's compensation, this subject was an old one. I have listened to one speaker after another this afternoon point out that in this program the employers can save lots of money, heavy losses, by watching for syphilis and perhaps eliminating the syphilitic. I probably have seen many reports on injured workers. In the aggregate I have seen quite a large number of cases in which underlying syphilis contributed tremendously to the cost, but out of an average of 100,000 cases a year in my jurisdiction a very small percentage of the total were in any way influenced by the syphilitic condition. It should be remembered that, under the principles of workmen's compensation, no employer, unless he is self insured, bears directly the cost of one injury. It is spread over industry in general. He pays in proportion to the experience in his particular group. That is the proper principle. Otherwise there would be even more restrictive physical examinations than exist today.

DR. A. S. LEVEN, Chicago: The reason I pop up at these meetings is that I feel the rank and file doctor ought to get up and say something. To leave everything to the authors of papers is all right—we can read it in our journals; but I think if popular discussion arises on the floor, then we really get an expression of opinion. I should like to suggest that more get up to speak if time permits. Every author has told us definitely the etiology, the symptomatology and the treatment for syphilis, both in industry and out of industry. Yet with all this information there are still the problems of syphilis. The reason is that the real etiologic factor, which was pointed out by the last discussor, is the socio-economic factor. We talk about that point but we ought to reemphasize it time and time again. In the problems of social diseases, tuberculosis and syphilis, when our society learns to cure our social and our economic ills we shall cure syphilis and tuberculosis.

DR. NORBERT ENZER, Milwaukee: In 1927 a routine Wassermann test was instituted for all patients admitted to our hospital and later this was amplified by other serologic tests on syphilis. I am unalterably opposed to dependence on clinical methods for the diagnosis of syphilis. What does the detection of syphilis mean to the individual? First, it must mean that the attending physician is provoked into a type of examination of that individual which he does not, under any other ordinary circumstances, employ. I would not expect that in any routine preemployment or periodic physical examination the early signs of neurosyphilis would be detected unless that physician has been stimulated by the knowledge of positive serologic observations. One thing labor and the public should recognize is that, in the last analysis, this program for the prevention and cure of public health syphilis is for the benefit of the syphilitic. Whether or not there is any justification for not employing a syphilitic person will depend, I think, on the knowledge and the application of that knowledge by conscientious physicians and not on any other reasons. I think an important point for physicians in the handling of syphilis is thorough understanding of the mechanism by which syphilis impairs and interferes with healing, such as in fractures, wounds and so on. I don't believe there is any proof that syphilitic involvement locally, at the site of the injury, is of major importance; rather, we are dealing with an individual who has a constitutional defect, generally deep seated in his nervous system and sometimes in his vascular system.

DR. S. S. KIRBY, Picayune, Miss.: I have waited for some one to say something about syphilis in the South. I come from a small town, with small industries, but where syphilis has become a major problem, because of the lack of treatment and because of lack of education of the people. In the community from which I come the industrial physician is the family physician. He works closely with the board of health; he also runs the syphilis clinic. So there is no such thing as a patient not

being able to get treatment, if he will have it. The thing that has been left out of the Southern policy is forcing treatment. We offer treatment for 10 cents a week. We get patients to come for ten or twenty weeks and then they stop. We go out to see them ourselves and they say they have had enough. It is only recently that I have been able to get employers to listen to forced treatment, and they have consented to discuss that with me on my return from this congress. But the industrial worker can get treatment at a price comparable to his level of earning, whether it is in the North or in the South. But we must not talk only of industrial workers. There is his family. As a family physician I say Why stress the industrial worker when he has a wife and children? I went to the homes of women who were pregnant—this was before the government gave us our medicine—and offered to give them treatment for 25 cents, if they would just come and take the treatment. We got, on the average, one out of every ten cases. So the problem does not present itself of forcing treatment on the industrial worker but on an industrial worker's family.

DR. EARL D. OSBORNE, Buffalo: I rise to take exception strenuously to one or two remarks Mr. Zimmer made. I was stimulated by some of the things he said, and I am quite in agreement with some of them; in fact, with most of them. The benefit of a syphilis program to the employee was stressed repeatedly in the paper of myself and my co-workers, and in the other papers also. He is the man that is being benefited. Also the employer is being benefited, as is the public. It was with some reluctance that a plant owner, who employs some 1,200 workers, most of them in the age group from 20 to 35, put in a syphilis program. We found fifty-seven workers in his plant with syphilis, which was a percentage of a little less than 5. Those patients were carefully examined. And yet that isn't to the benefit of the employees! Whom is it benefiting? What would have happened to those individuals if their syphilis hadn't been found? Wouldn't the employees have gone on and developed late cardiovascular aneurysms and died a cardiovascular death? Many of them would have developed dementia paralytica and insanity. To whose benefit was it, but to theirs, to have a syphilis program? As to the cost, I am absolutely convinced that no one with syphilis need go without adequate treatment, and I don't believe 90 per cent of the individuals who come back and say they can't get treatment because they can't afford it. I know from personal experience that adequately trained individuals are willing to treat a patient for syphilis under one facility or another, whether in private practice, a semiprivate clinic or a free clinic, for whatever the patient can afford. I know it is generally the rule today, even among the most highly skilled syphilologists, that they will treat an individual with syphilis down to \$3 or even \$2 a week, provided he takes strenuous treatment and keeps at it.

DR. ALBERT E. RUSSELL, Chicago: I tried to stress in my paper the importance of routine blood testing. One of the big hospitals in this country reports that over 60 per cent of the patients who come there who have cardiovascular syphilis absolutely had no knowledge that they ever had syphilis. For that reason, and for many others, I believe that routine blood testing is important, no matter how good a diagnostician one might be. I should like to add a word about the cooperation I have had from labor groups. It is my particular duty and assignment to promote syphilis programs in industry. We sell the idea. We usually don't have to sell the plant physician, but we help him to sell the management in many places. Then we take the work into consideration. By approaching the heads of the unions or the leaders of their groups, we explain to them what it is about. We have had a most interesting and most happy result. In some instances the union has insisted that the management assure them they will carry out the program as recommended by the Surgeon General of the Public Health Service, and in so doing we have had nothing but amicable relations. In one of our programs the plant physician and even the personnel man said to us that they felt it brought the employer and the employee closer together, because the physician carried out his program in confidence between him and the worker. The management didn't know which were the positive cases. We have prepared articles for labor magazines, trade journals and plant papers and, even though we have started programs in plants where

there has been recent labor trouble, this syphilis program seems to be one that is going along nicely for the employee and the employer. We have not singled out the industrial worker alone to promote this syphilis program. Of the blood tests taken in Chicago last year, I believe 66,000 of them were listed as industrial workers. The industrial program is only a small part of the big syphilis program.

DR. HAROLD A. VONACHEN, Peoria, Ill.: I, like Dr. Osborne, was going to say nothing until Mr. Zimmer took the platform. The only difference between Dr. Osborne and myself is that he agrees with most of the things and I disagree with most of the things. What does industry gain by a syphilis program in comparison to what the human being gains? We have got to come in this country to the point at which we get away from class distinction both by the labor department and by everybody else connected with the government. I am speaking now as a private individual. If Mr. Zimmer would know his statistics, he would find that George Washington University, in his own city of Washington, D. C., took blood tests of its students long before there was any industrial program in the United States. He would find, by reading the women's journals, that many women's clubs had blood tests. Association of commerce members have their blood tested by their family physicians. I feel it is a grave injustice to industry for Mr. Zimmer to make the remarks he has made this afternoon.

DR. HARVEY BARTLE, Philadelphia: I am a little favorable to Mr. Zimmer's remarks. I think I have got in contact with labor pretty well in the last thirty-four years. I think the reaction expressed today should have some consideration. However, I should like to call attention to another group who have Wassermann reactions. They are the prospective bridegrooms. I am heartily in favor of routine Wassermann tests for every individual in the United States, irrespective of class. We shall get somewhere then. I don't know that we have a right to demand routine Wassermann tests among laborers any more than we have a right to demand an x-ray examination of the vertebral column or of the chest. We have just as many involvements in industry from those sources. The rehabilitation surgeon, of course, wouldn't want routine roentgenograms of the vertebral column taken because that would rob him of a lucrative practice. But there is an involving issue and, after all, there is a common sense approach to it. (To be continued)

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES

A two day session of the Board of Trustees was held at the headquarters of the Association on Thursday and Friday, February 15 and 16, preceded by a day and evening session of the Executive Committee on February 14, at which the business of the Association received careful consideration. Space permits only a brief abstract of these deliberations.

APPOINTMENTS

The following appointments were made to editorial boards of special journals and to councils and committees (unless otherwise stated the appointee succeeds himself):

Archives of Surgery, Dr. Evarts A. Graham. *Archives of Ophthalmology*, Dr. Francis Heed Adler. *American Journal of Diseases of Children*, Dr. A. Graeme Mitchell; Dr. Francis Scott Smyth, San Francisco, to succeed Dr. John C. Gittings, resigned. *Archives of Neurology and Psychiatry*, Dr. Stanley Cobb. *Archives of Otolaryngology*, Dr. John F. Barnhill. *Archives of Pathology*, Drs. S. B. Wolbach and Oscar T. Schultz; Dr. George H. Whipple, Rochester, N. Y., to succeed Dr. Alfred Stengel, deceased. *Archives of Dermatology and Syphilology*, Dr. Fred D. Weidman. *Archives of Internal Medicine*, Dr. John H. Musser. COUNCIL ON PHARMACY AND CHEMISTRY, Drs. Morris Fishbein, Perrin H. Long, G. W. McCoy and E. M. Nelson. COUNCIL ON PHYSICAL THERAPY, Drs. Frank R. Ober and Frank D. Dickson; Dr. Eben J. Carey, Milwaukee, to succeed Dr. Howard T. Karsner. COUNCIL ON FOODS, Drs. Morris Fishbein and Irvine McQuarrie. COMMITTEE ON SCIENTIFIC RESEARCH, Dr. Martin H.

Fischer; Dr. E. W. Goodpasture, Nashville, Tenn., to succeed Dr. C. C. Bass, resigned. COMMITTEE FOR THE PROTECTION OF MEDICAL RESEARCH, Dr. William J. Kerr and Rev. A. M. Schwitalla.

REPRESENTATIVE ON AMERICAN DOCUMENTATION INSTITUTE

Dr. Ludvig Hektoen was reappointed as representative of the American Medical Association on the American Documentation Institute.

REPRESENTATIVES TO MEETING OF CANADIAN MEDICAL ASSOCIATION

Delegates were selected to represent the American Medical Association at the meeting of the Canadian Medical Association, to be held in Toronto June 17 to 21.

COUNCIL ON INDUSTRIAL HEALTH

The terms of service of members of the Council on Industrial Health, suggested by the Council itself, received the approval of the board.

COMMITTEE ON AMERICAN HEALTH RESORTS

The Board authorized that arrangements be made to proceed with the work of the Committee on American Health Resorts.

APPROPRIATIONS

Appropriations were made for the conduct of the work of the various councils, bureaus and committees, as well as for scientific and therapeutic research.

REQUESTS FOR CUMULATED INDEXES OF SPECIAL JOURNALS

The Board decided not to authorize the publication at this time of cumulated indexes of any of the Association's special journals, since the response to notices published in four of those periodicals was too small to justify the undertaking.

TRANSFER OF INDUSTRIAL HYGIENE FROM UNITED STATES PUBLIC HEALTH SERVICE

The following preambles and resolution adopted by the Council on Industrial Health were approved by the Board:

WHEREAS, It has been brought to the attention of the Council on Industrial Health that certain proposed legislation contemplates the placing of responsibility for the development of industrial hygiene in an agency of the federal government other than that of the United States Public Health Service; and

WHEREAS, This Council believes that the interests of workers in industry will be best served by continuing this activity under the sponsorship of an agency which because of basic training in the broad aspects of industrial health assures attention to the varied interests involved; therefore be it

Resolved, That the Council on Industrial Health bring to the attention of the Board of Trustees matters regarding industrial hygiene incorporated in Senate bills 1620 and 2256, and that it is the sense of the Council that:

1. The interests of the industrial worker will best be served by continued concentration of industrial hygiene in the federal and state health departments, and that these bills as they affect industrial hygiene be opposed; but that

2. Due recognition be given to the desirability for cooperation with, as well as assistance from, other established agencies interested in this field having facilities for regulation and enforcement.

EXHIBITS AT NEW YORK SESSION

Arrangements were approved for the preparation of exhibits of the Council on Medical Education and Hospitals, Council on Pharmacy and Chemistry, Council on Physical Therapy and Council on Industrial Health and of the special journals at the New York session of the Association.

A. M. A. DAY AT NEW YORK WORLD'S FAIR

Arrangements for A. M. A. Day at the New York World's Fair during the New York session received the approval of the Board.

SPECIAL ISSUE OF ARCHIVES OF OPHTHALMOLOGY IN HONOR OF DR. F. H. VERHOEFF

The Board approved the publication of a special issue of the *Archives of Ophthalmology* in honor of Dr. F. H. Verhoeff, Boston, who for a number of years was professor of ophthalmic research at Harvard Medical School, and who recently retired.

INVESTMENTS

Considerable time was devoted by both the Finance Committee and the Board of Trustees to the matter of investing the funds of the Association.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Tuberculosis Institute.—An Indian Service Tuberculosis Institute was held at the Navajo Medical Center, Fort Defiance, February 12-14, attended by 121 federal, state and county health organization employees. Those conducting the program included Dr. Esmond R. Long and Miss Margaret Smith, of the Henry Phipps Institute of the University of Pennsylvania, Philadelphia; Miss Rosalie Peterson, R.N., of the Office of Indian Affairs, Washington, D. C.; Drs. Ralph B. Snavely, San Francisco; Estella Ford Warner, Albuquerque, N. M., and William W. Peter, Window Rock. Physicians and nurses from eleven Indian agencies in the Southwest also participated in the program. There are three tuberculosis sanatoriums with a bed capacity of 200 for a population of 50,000 Indians on the Navajo reservation of 25,000 square miles; there are also nine general hospitals occasionally admitting tuberculosis patients. Supplementing the work of these twelve institutions, field work, primarily to discover early cases of tuberculosis, is conducted by Dr. Horace P. Mahan, Winslow; Miss Esther Sandstrom, R.N., and Miss Violet Sobers, R.N.

ARKANSAS

Postgraduate Course.—The eighth two day course of postgraduate instruction, sponsored by the state medical society and the University of Arkansas School of Medicine, Little Rock, was held at the medical school, January 24-25. The guest speakers included: Drs. Henry H. Turner, Oklahoma City, on "Hypothyroidism"; Ferdinand C. Helwig, Kansas City, Mo., "Relationship of Trauma to Tumors," and Charles F. Geschickter, Baltimore, "Tumors of Bones." Other speakers, all of Little Rock, were:

Dr. Harvey Shipp, Operative Treatment in Pulmonary Tuberculosis.
Dr. Hoyt R. Allen, Diagnosis and Treatment of Common Ailments of the Rectum and Anal Canal.

Dr. Merlin J. Kilbury, Interpretations of Laboratory Findings.
Dr. Raymond L. Gregory, Frequent Mistakes in the Diagnosis of

Dr. " " " " of the Stomach: Its Incidence in

Dr. " " " " and Findings in the X-Ray Examination of the Lower Part of the Back.

Dr. Joseph Franklin Shuffield, Low Back Pain from the Standpoint of the Orthopedic Surgeon.

Dr. Herbert Fay H. Jones, Low Back Pain from the Standpoint of the Urologist.

Dr. Joseph H. Sanderlin, Low Back Pain from the Standpoint of the Gynecologist.

Dr. Helwig addressed the dinner meeting on "Medicolegal Aspects of Alcoholic Intoxication."

DISTRICT OF COLUMBIA

Postgraduate Course in Ophthalmology.—The fourth annual postgraduate course in ophthalmology at the George Washington University School of Medicine will be held March 25-30. A practical course limited to twenty-five participants in surgery, pathology and orthoptics will be held March 19-23. Additional information may be obtained from the school, 1335 H Street Northwest, Washington.

Health Instruction for Employees.—The District Works Projects Administration opened a six weeks' health institute, January 15, to provide instruction in the essential facts of everyday health problems for 3,700 employees of its professional and service divisions, according to *Medical Annals*. Cooperating with the WPA are the district health department, the speakers' bureau of the Medical Society of the District of Columbia and the Medico-Chirurgical Society.

Postgraduate Courses.—The committee on postgraduate education of the Medical Society of the District of Columbia is conducting a series of postgraduate courses. The first group of lectures constituted a course on syphilology with the following speakers: Dr. John A. Kolmer, Philadelphia, January 15, on "Principles in Diagnosis and Treatment of Syphilis" and Reuben L. Kahn, Sc.D., Ann Arbor, Mich., January 22, "Interpreting Serologic Reactions in Syphilis." Other subjects to be covered in subsequent courses, provided the interest is sufficient, include psychoneuroses in general practice, office surgical procedures, cutaneous diseases in general practice, obscure fevers and preventive pediatrics.

Society News.—Dr. Raymond L. Pfeiffer, New York, discussed "Lesions of Chiasm" before the Washington Ophthalmological Society, February 12.—At a meeting of the George Washington University Medical Society, January 20, Dr. William Wayne Babcock, Philadelphia, discussed abdominal surgery.—Lyman J. Briggs, Ph.D., director of the bureau of standards, discussed "Developments in Modern Physics and Their Relation to Medicine" before the Academy of Medicine of Washington, February 29.—Dr. Hugo Roesler, Philadelphia, will discuss "Roentgenological Aspects of Cardiovascular Disease" before the Washington Heart Association, April 10.—At a meeting of the Washington Society of Pathologists, January 6, the speakers included Drs. Harold E. Ragle on "Tumor of the Sacrococcygeal Region" and Janvier W. Lindsay, "Carcinoma of the Esophagus; Early Carcinoma of the Larynx."

ILLINOIS

Personal.—Dr. Edward F. Dombrowski, managing officer of the Chicago State Hospital, was recently made president of the Conference of Managing Officers of the state department of public welfare.—Dr. Eugene J. Chesrow, Chicago, has been appointed superintendent of the Oak Forest Infirmary, newspapers reported.—The McDonough County Medical Society recently presented to Dr. Elizabeth R. Miner, Macomb, a check as a token of its appreciation of her work as secretary of the society for the last fifteen years. Dr. Miner was elected for life to this office but has resigned. She and her husband will spend their winters in Florida. She has been delegate to the state medical society for twenty years and has held every office in the county society as well as the office of second vice president of the state society.

Chicago

Midwinter Clinical Meeting.—The South Side Medical Assembly, the annual midwinter clinical meeting of the Calumet, South Chicago, South Side, Southern Cook County and Stock Yards branches of the Chicago Medical Society, was held, February 14. Sessions were devoted to discussions of pneumonia, modern treatment of urologic diseases, sulfanilamide and its compounds, obstetrics, cancer, hormones, fractures and cardiac diseases.

Dr. Bacon Honored.—A testimonial dinner was held in honor of Dr. Charles Sumner Bacon, February 6, in recognition of his sixteen years' service as chief of staff at the Booth Memorial Hospital, which is under the auspices of the Salvation Army. He is 83 years of age. The hospital cares for unwed mothers and their babies. Services of the staff are volunteered. Dr. Bacon, who graduated at Northwestern University Medical School in 1884, served as professor and head of the department of gynecology and obstetrics at the University of Illinois College of Medicine for many years and has been emeritus professor since 1926. He was president of the Illinois State Medical Society, 1905-1906, and of the Chicago Gynecological Society, 1902-1903 and 1923-1924. The Bacon lectures at the University of Illinois are named in his honor.

Society News.—The Chicago Society of Internal Medicine was addressed, January 22, by Drs. Robert G. Bloch and Abraham J. Kauvar on "Schaumann's Disease (Boeck's Sarcoid)"; Henry T. Ricketts, "The Constancy of Action of Protamine Zinc Insulin," and James G. Carr, Alexander Saunders and Gilbert H. Marquardt, "Studies of Angina Pectoris."—A symposium on syphilis constituted the program of the Chicago Laryngological and Otolological Society, February 5; the speakers were Drs. Lawrence J. Lawson, Evanston; John F. Delph, Francis E. Seneor, James H. Mitchell, Samuel J. Pearlman and Joseph Welfeld.—Among others, Drs. Roland S. Cron, Harold W. Shutter and Albert H. Lahmann, Milwaukee, discussed "Epidemic Infectious Diarrhea of the Newborn" before the Chicago Gynecological Society, February 16.—Among others, Dr. Walter P. Blount, Milwaukee, addressed the Chicago Orthopaedic Society, February 9, on "Osteotomy of the Humerus in the Treatment of Obstetrical Shoulder Lesions."

KANSAS

New Director of Tuberculosis Control.—Dr. Floyd C. Beelman, Wichita, for three years health officer of Sedgwick County, has accepted the position of director of the division of tuberculosis control of the Kansas State Board of Health. Dr. Henry H. Asher has succeeded Dr. Beelman in Sedgwick County.

University News.—Dr. John F. Fulton, New Haven, Conn., lectured at the Museum of Medical History, University of Kansas Hospitals, Kansas City, February 5, on "The History

of Physiology." Dr. Franklin G. Ebaugh, Denver, delivered the William W. Root Lecture, February 9, on "The Psychoneuroses in the General Practice of Medicine."

Annual Postgraduate Clinics.—The University of Kansas School of Medicine will hold its annual postgraduate clinics March 18-21. Presentation of clinical cases with emphasis on therapy will be a feature of the courses. An effort will be made to demonstrate therapeutic procedures that the general practitioner can apply to his office practice. Additional information may be obtained from Dr. Hugh L. Dwyer, chairman, committee on postgraduate clinics, University of Kansas School of Medicine, Kansas City.

MARYLAND

Dr. Lomas Resigns from University Hospital.—Dr. Arthur J. Lomas has resigned as head of the University Hospital, Baltimore, after holding the position for sixteen years, according to *Modern Hospital*. He plans to serve as administrative consultant to five Catholic hospitals in Maryland: Mercy, St. Joseph's, Bon Secours and St. Agnes hospitals, all of Baltimore, and the Allegany Hospital, Cumberland. Dr. John E. Savage is acting medical superintendent of the University Hospital.

Society News.—A joint meeting of the Baltimore City Medical Society and its radiologic section was addressed, March 1, by Dr. William P. Healy, New York, on "Radiation and Surgery in the Treatment of Carcinoma of the Uterine Cervix and of the Corpus." The society will be addressed, March 15, by Drs. Tibor de Cholnoky, New York, on "Rehabilitation in Advanced Cancer," and Alston E. Morrison, "Diagnosis of Nonopaque Foreign Bodies in the Lower Respiratory Tract."—The Osler Historical Club was addressed in Baltimore, March 12, by Dr. Frederick B. Bang, Baltimore, on "Influence of Bacteriologic Discoveries on the Epidemiologic Theories of the Nineteenth Century," and Dr. John McW. McDonald, "Life and Works of Ramazzini."—Dr. Arthur M. Shipley discussed "Treatment of Gunshot and Stab Wounds of Chest and Abdomen" in a clinic before the Howard County Medical Society in Baltimore, January 23.

MINNESOTA

Personal.—Dr. Harold S. Diehl, dean of medical sciences, University of Minnesota Medical School, Minneapolis, has been appointed a member of the National Advisory Health Council of the U. S. Public Health Service.

Society News.—A symposium on painful conditions about the head and face was presented before the Ramsey County Medical Society, February 26, in St. Paul, by Drs. Gordon R. Kamman, Gordon E. Strate and Wallace P. Ritchie, St. Paul. —The Minnesota Pathological Society was addressed in Minneapolis, February 20, by Drs. James S. McCartney on "Dissecting Aneurysm of the Aorta" and Lawrence Berman, "Cancer as a Cause of Death in Minnesota."

MISSOURI

Society News.—Dr. Allen O. Whipple, New York, will discuss application of chemistry to the preoperative and post-operative care of surgical patients before the Kansas City Academy of Medicine, March 15.—Dr. Irwin I. Rosenthal, St. Joseph, addressed the Buchanan County Medical Society in St. Joseph, February 7, on "Recent Advances in Anesthesia."—The Kansas City Society of Ophthalmology, Otolaryngology, Rhinology and Laryngology was addressed, January 18, by Drs. Harry S. Gradle, Chicago; Norton Canfield, New Haven, Conn.; Andrew A. Eggston, New York, and Walter Hughson, Abington, Pa. Drs. Gradle and Eggston addressed the dinner meeting on "Glaucoma Capsulare" and "Pathology of Mastoiditis, Petrositis and Meningitis" respectively.—At a meeting of the Kansas City Obstetrical and Gynecological Society, January 11, the speakers were Drs. Richard G. Helman on "The Undilated Cervix"; Herbert F. Vanorden, "Term Delivery in a Patient with Deformed Pelvis Caused by Multiple Fractures," and Joseph G. Webster, "Case of Toxemia of Pregnancy."

Pneumonia Control Program.—The state department of health recently has begun a program to control pneumonia. At present the program will be limited to the eight counties maintaining full time public health units but will be extended into other parts of the state as soon as facilities permit. In January, the department furnished the local units with materials for typing and sulfapyridine and antipneumococcic serums for treatment. Physicians may receive the drugs for use in indi-

gent cases. This year Missouri received government funds for pneumonia control work. Regional conferences of public health personnel were held in December to explain the new program with Dr. Henry A. Holle, regional consultant in pneumonia, U. S. Public Health Service, showing films on diagnosis and therapy.

Medicomilitary Symposium.—The annual spring medicomilitary symposium will be in the Jackson County Medical Society's Auditorium in the Municipal General Hospital, Kansas City, March 14-15. The program lists the following guest speakers:

Dr. Ralph A. Kinsella, St. Louis, Physical Diagnosis in Acute Diseases of the Chest.

Dr. Hiram Winnett Orr, Lincoln, Neb., Relationship of Wound Treatment to the Care of Compound Fractures.

Dr. Alfred I. Folsom, Dallas, Texas, Some Overlooked Facts in the Treatment of Chronic Gonorrhea.

Dr. Arthur A. Zierold, Minneapolis, Head Injuries.

Dr. Walter A. Carlson, Randolph Field, Texas, Aviation and Its Medical Problems.

Dr. Frederick A. Jostes, St. Louis, Conservative Treatment of Low Back Disability.

A joint meeting with the Jackson and Wyandotte county medical societies will be held March 14.

MONTANA

Tularemia Infection in Streams.—The staff of the Rocky Mountain Laboratory of the U. S. Public Health Service recently reported that three Montana streams have been found to be contaminated with *Bacterium tularensis*. The discovery was made in the course of studies of epizootic tularemia in beaver. Two of the streams are flowing creeks and the other at certain times of the year consists of a succession of pools. Three samples taken over a period of twenty-eight days showed contamination and guinea-pigs that received the water became infected.

NEW JERSEY

Society News.—Dr. Arthur M. Fishberg, New York, addressed the Hudson County Medical Society, Jersey City, February 6, on "Recent Advances in Cardiovascular-Renal Diseases."—Dr. Edward W. Sprague, Newark, was elected president of the Society of Surgeons of New Jersey at the annual meeting in Camden, January 31.—Dr. Priscilla White, Boston, addressed the Atlantic County Medical Society, Atlantic City, February 9, on recent advances in diabetes.—Dr. E. Arthur Whitney, Elwyn, Pa., addressed the Cumberland County Medical Society, Vineland, February 13, on "Medical Aspects of the Care of the Feeble-minded."—Dr. Paul Geary, Plainfield, addressed the Morris County Medical Society, Morris Plains, February 15, on "Nontuberculous Pulmonary Abscess."

NEW YORK

Personal.—Dr. Harvey S. Kinne, Albany, recently an assistant district health officer on the staff of the state health department, has been appointed health commissioner of Cortland County.

Society News.—Dr. Burrill B. Crohn, New York, addressed the Medical Society of the County of Albany in Albany, February 28, on peptic ulcer.—Dr. Lewis M. Hurxthal, Boston, addressed the Dutchess County Medical Society, Poughkeepsie, February 14, on endocrinology.—Dr. Edward G. Waters, Jersey City, N. J., addressed the Onondaga County Medical Society, Syracuse, March 5, on "Injuries to the Birth Canal During Parturition."

New York City

Dr. Barringer Honored.—Dr. Emily Dunning Barringer was honored with a dinner, March 2, by the staff of the Kingston Avenue Hospital on the occasion of her retirement as director of gynecology after twenty-one years of service. Speakers were to include: Drs. Terry M. Townsend, president of the Medical Society of the State of New York; Nathan B. Van Etten, President-Elect of the American Medical Association; Sigismund S. Goldwater, commissioner of hospitals; Elise D. S. L'Esperance, of the New York Infirmary for Women and Children; Thurman B. Givan, visiting physician, and Hyman Strauss, visiting gynecologist, Kingston Avenue Hospital; Anna W. Williams, former assistant director of laboratories, New York City Health Department; Robert M. Lewis, associate clinical professor of obstetrics and gynecology, Yale University School of Medicine, New Haven, Conn.; Miss Julia K. Jaffray, secretary of the National Committee on Prisons and Prison Labor; Hon. Anna M. Krosc, city magistrate, and Dr. Barringer.

Society News.—Drs. Josephine B. Neal and Joseph J. Bunim addressed the Medical Society of the County of New York, February 26, on "Chemotherapy in Meningitis" and "Use of Sulfapyridine in Treatment of Pneumococcus Pneumonia" respectively. At a meeting of the New York chapter of the National Gastroenterological Association, February 19, the speakers presented a symposium on gastric cancer. The speakers were Drs. James Ewing, Cornelius P. Rhoads, Edward M. Livingstone, George T. Pack and Dana W. Atchley, New York, and Frederick A. Collier, Ann Arbor, Mich., addressed the New York Academy of Medicine, March 7, on medical and surgical considerations, respectively, of "Clinical Manifestations and Management of Disturbances in Water Metabolism." Dr. John P. Peters, New Haven, Conn., was a discussant. At a combined meeting of the section of neurology and psychiatry of the New York Academy of Medicine and the New York Neurological Society, March 12, Dr. Eli Jefferson Browder will speak on "Spinal Epidural Infections: Surgical and Pathological Consideration" and Dr. Francis A. Echlin, Montreal, Que., "Focal Cerebral Ischemia and Reactive Gliosis Following Experimental Vascular Spasm."

rence Selling, Portland, addressed the Polk-Yamhill-Marion Counties Medical Society in Salem, February 13, on "Herniation of the Intervertebral Disk" and "Hypertrophy of the Ligamentum Flavum."

PENNSYLVANIA

Advisory Health Board Appointed.—Gov. Arthur H. James recently appointed new members of the advisory board to the state department of health. The appointees were Drs. George Morris Piersol, professor of medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia; David W. Thomas, Lock Haven, president of the Medical Society of the State of Pennsylvania; William Gray Turnbull, superintendent of the Philadelphia General Hospital; Donald Guthrie, chief surgeon of the Packer Hospital, Sayre; Ivor Griffith, Pharm.D., dean of the Philadelphia College of Pharmacy and Science, and Archibald Nance, Pittsburgh, a civil engineer.

Philadelphia

Personal.—Dr. Basil R. Beltran has resigned as medical director and chief surgeon of the Eastern State Penitentiary Hospital, which was to be opened for patients on March 7. He will devote his time to his work as surgeon in chief at Nazareth Hospital, which was to be opened for patients on March 7.

Hospital News.—Temple University Hospital dedicated a new floor and other improvements in the building, February 14. The new fifth floor has thirty-three rooms, principally for maternity patients. Operating rooms have been air conditioned, and soundproofing was placed in private and semiprivate rooms and in corridors.

More Gifts to the University.—The University of Pennsylvania recently announced additional gifts to its bicentennial fund. Among those for medical purposes are the following: Eldridge R. Johnson, \$10,000 for the Johnson Foundation for Research in Medical Physics, which he established. Mrs. Arthur W. Thompson, \$6,000 to the Thompson Vitamin Research Fund.

National Committee on Maternal Health, \$3,000. Rockefeller Foundation, \$2,650. Josiah Macy Jr. Foundation, \$2,650. Mead Johnson & Co., \$1,500. International Cancer Research Foundation, \$1,334. John Frederick Lewis Jr., Philadelphia attorney, \$25,000 added to a previous gift of \$25,000 by Mr. Lewis and his brother to provide a floor for ophthalmology in the new hospital unit now under construction. Mrs. Lewis H. Adler, \$1,000, and Miss Julia Lewis, \$600 for the department of ophthalmology.

SOUTH CAROLINA

Society News.—Dr. Joseph M. Feder addressed the Anderson County Medical Society, Anderson, January 10, on "Investigation of Hepatic Function and the Evaluation of Vitamin K Therapy." Dr. De Forest C. Jarvis, Barre, Vt., addressed the Greenville County Medical Society, Greenville, January 10, on "Biochemistry in Everyday Medicine from a Research Group Study." Drs. Richard W. TeLinde, Baltimore, and George R. Wilkinson, Greenville, addressed the society, February 5, on "Organic Causes of Uterine Bleeding." Dr. Wells P. Eagleton, Newark, N. J., addressed the society, February 8, on "A Philosophical Review of the Advances in the Treatment of Meningitis." Dr. Frank P. Coleman, Columbia, addressed the Edisto Medical Society, Orangeburg, January 24, on "Water Balance in the Medically and Surgically Sick." Dr. Julian M. Ruffin, Durham, N. C., addressed the Medical Society of South Carolina, Charleston, January 9, on "Gastroscopy." At a meeting of the Oconee County Medical Society in Seneca, January 4, Dr. Wofford E. Baldwin, Walhalla, county health officer, discussed a plan to establish contraceptive clinics and the syphilis control campaign, and Dr. Rowland F. Zeigler Jr., Seneca, led a round table discussion on sulfapyridine treatment of pneumonia.

TEXAS

Hospital News.—Colonel and Mrs. J. W. Neal, Houston, recently established a trust fund of \$100,000 for Memorial Hospital, Houston, as a memorial to their son who died recently. The interest is to be used to provide x-ray treatment for those unable to pay for it.

New Health Officers.—Dr. Clark E. Phillips, Orange, has been appointed health officer of Orange County to succeed the late Dr. Jefferson D. Yates. Dr. Cecil G. Yarbrough Jr., Midland, has been appointed health officer of a new Midland city and county health unit.

OHIO

Inter-County Meetings.—The Erie County Medical Society is presenting its second series of clinical lectures in Sandusky, with members of adjacent county societies as guests. Following is the series:

January 17, Dr. Henry J. John, Cleveland, Principles of Treatment of Diabetes.
February 14, Dr. Clarence W. Engler, Cleveland, Sinusitis.
March 13, Dr. James L. Reycraft, Cleveland, Operative Treatment of Uterine Prolapse, Cystocele and Rectocele.
April 17, (1) Dr. Walter G. Stern, Cleveland, Is Prepaid Medical Insurance Necessary Today? If So, A Practical Plan for Same; (2) The Estimation of Disability Following Injury, and (3) Milton Landy, referee of the State Industrial Commission, The Legal Phase of Statewide Prepaid Medical Insurance.

Society News.—Dr. James L. Wade, Parkersburg, W. Va., addressed the Washington County Medical Society, Marietta, January 10, on myasthenia gravis. Drs. Carl E. Evans and John E. Hendricks, Newark, addressed the Tuscarawas County Medical Society, Newark, January 11, on "Surgical Considerations of the Abdominal Cavity" and "Removing Foreign Bodies from the Lungs" respectively. Dr. Charles R. Austrian, Baltimore, addressed the Academy of Medicine of Cleveland, February 16, on "Chronic Nontuberculous Infections of the Lungs." Dr. Leroy U. Gardner, Saranac Lake, N. Y., addressed the Academy of Medicine of Cincinnati, February 20, on "Pneumoconiosis." Dr. Robert L. Schaefer, Detroit, addressed the Summit County Medical Society, Akron, February 6, on "Diagnostic and Therapeutic Endocrine Facts of Value to Patient and Physician."

OREGON

Dr. Kinney's Ninetieth Birthday.—Dr. Alfred C. Kinney, Seaview, Wash., first and fiftieth president of the Oregon State Medical Society, was entertained at a luncheon in Portland, January 30, planned and attended by the four other surviving members of the first state board of health, celebrating his ninetytieth birthday. Dr. Kinney related that the bill creating the board of health was written by Dr. Oliver Wendell Holmes. While studying in Massachusetts, Dr. Kinney met Dr. Holmes, brought the bill, modeled on the Massachusetts statute, home in his pocket and gave it to a legislator for introduction in 1872. It was not enacted, however, until 1903. The other original members who attended the luncheon were Drs. Andrew C. Smith, Charles J. Smith, Edward Allen Pierce, Portland, and Willis B. Morse, Salem.

Society News.—A symposium on "Fluid Administration by Parenteral Methods" was presented before the Multnomah County Medical Society, Portland, February 21, by Drs. Albert W. Holman, Louis P. Gambee, Homer P. Rush and Thomas D. Robertson. Dr. Simeon T. Cantril, Seattle, addressed the Lane County Medical Society, Eugene, February 16, on radiation treatment of burns at a meeting of the Yamhill County Medical Society, McMinnville, February 6. The Umatilla County Medical Society was recently reorganized with Dr. Joseph P. Brennan, Pendleton, as president and Dr. Theodore M. Barber, Pendleton, secretary. At a meeting, February 13, Dr. Richard H. Wilcox, Pendleton, county health officer, spoke on "Regulations Pertaining to Communicable Diseases" and W. C. Perry, attorney, on "The Doctor on the Witness Stand." Dr. Lau-

Personal.—Dr. and Mrs. Robert W. Noble, Temple, recently celebrated their golden wedding anniversary. Dr. Noble was formerly a member of the state board of health and has been health officer of Temple for many years, according to the *Texas State Journal of Medicine*.—Dr. Green L. Davidson, Wharton, was recently elected president for life of the Wharton-Jackson Counties Medical Society.

Special Society Meeting.—Dr. James W. Ward, Greenville, was elected president of the Texas Ophthalmological and Otolaryngological Society at its annual meeting in Houston recently. The guest speakers were Drs. Dean M. Lierle, Iowa City, who discussed "Surgical Sinusitis" and "Vertigo," and Daniel B. Kirby, New York, "Difficulties During Cataract Extractions" and "Difficulties After Cataract Extractions."

UTAH

A Case of Plague.—The U. S. Public Health Service was informed, February 6, of a case of bubonic plague in Utah. The disease was in a man aged 29 who was thought to have been infected when skinning a coyote.

GENERAL

New Officers of National Health Council.—Dr. Kendall Emerson, managing director of the National Tuberculosis Association, New York, has been elected president of the National Health Council, it was announced, February 21. Dr. Reginald M. Atwater, executive secretary of the American Public Health Association, is the new vice president and Miss Dorothy Deming, general director of the National Organization for Public Health Nursing, secretary.

Film on Hearing Aids.—"Life Begins Again" is the title of a motion picture prepared by the Western Electric Company to demonstrate the possibilities of aid to persons with hearing defects. The picture dwells particularly on problems in school children and shows the correct procedure for discovering deficiencies in hearing by means of the audiometer. Included in the film is an animated sequence which demonstrates how the human auditory system works. Theaters may obtain the film without charge.

General Pershing Receives Snow Medal.—General John J. Pershing was awarded the William Freeman Snow Medal for distinguished service to mankind at the annual meeting of the American Social Hygiene Association in Chicago, February 1. Major Gen. Merritte W. Ireland, former surgeon general, U. S. Army, made the presentation and General Pershing accepted by telephone from Tucson, Ariz. General Pershing was the first chairman and one of the founders of the national antisiphilis committee sponsored by the social hygiene association in 1937. This is the third presentation of the medal, which honors Dr. Snow for his long service as general director of the association.

Pacific Coast Surgical Meeting.—The annual meeting of the Pacific Coast Surgical Association will be held in Portland, Ore., April 3-6, under the presidency of Dr. Richard B. Dillehunt, Portland. The guest speakers will be:

- Dr. Andrew A. Matthews, Spokane, Wash., Cancer of the Breast.
- Dr. Albert J. Scholl, Los Angeles, Utererel Stones, A Nonsurgical Method of Treatment.
- Dr. Herbert S. Chapman, Stockton, Calif., Unusual Tumors of the Endocrine System.
- Dr. Robertson Ward, San Francisco, Appendicitis with Complications; Reduction of Mortality by Continuous Gastric Lavage.
- Dr. Charles T. Sturgeon, Los Angeles, Pulsion Diverticula of the Hypopharynx.

Courses Sponsored by College of Physicians.—The American College of Physicians announces its third annual series of courses for its fellows and associates, arranged through the cooperation of the directors and the institutions at which the courses are given. The courses are as follows:

- General Medicine, University of Michigan Medical School and Hospital, Ann Arbor, Dr. Cyrus C. Sturgis, director, March 18-30.
- Medicine in industry, Henry Ford Hospital, Detroit, Dr. Frank J. Sladen, director, March 25-30.
- Allergy, Roosevelt Hospital, New York, Dr. Robert A. Cooke, director, March 19-30.
- The blood and the blood cell forming organs in disease, Ohio State University College of Medicine, Columbus, Dr. Charles A. Doan, director, March 25-29.
- Cardiovascular disease, State University of Iowa College of Medicine, Iowa City, Dr. Fred M. Smith, director, March 25-30.

League Against Rheumatism Not Dissolved.—Although the bureau of the Ligue internationale contre le rhumatisme in Amsterdam has been closed, as previously announced by THE JOURNAL (Nov. 11, 1939, page 1821), it is announced by the president, Dr. Ralph Pemberton, Philadelphia, that the league is not dissolved and that the present structure and personnel of the league should be maintained for the duration of

the war, ready to resume activities as soon as circumstances permit. Formal dissolution of such a body as the league must depend on formal action by its constituent members or a body acting for them, and this step has not been taken.

Societies for Experimental Biology.—The Federation of American Societies for Experimental Biology will hold its annual meeting at the Roosevelt Hotel, New Orleans, March 13-16. The federation is composed of the American Physiological Society, the American Society of Biological Chemists, Inc., the American Society for Pharmacology and Experimental Therapeutics, Inc., and the American Society for Experimental Pathology. The scientific session will open with a joint meeting. Symposia held in the various sections will include the following subjects: blood coagulation, muscle, biochemistry of the lipids; hormones; tissue respiration; stable and radioactive isotopes as tracers in biologic research; recent advances in therapeutics. The annual dinner will be Friday evening and business meetings of all societies will be held Thursday and Friday.

Government Services

General Marietta Appointed Assistant Surgeon General

Brig. Gen. Shelley U. Marietta, Medical Corps, U. S. Army, has been appointed assistant to the Surgeon General of the Army. General Marietta was graduated from the University of Illinois School of Medicine, Chicago, in 1909 and from the Army Medical School in 1912. He has served at various stations in the United States, in the Philippine Islands, in France and in Hawaii.

New Members of Veterans' Medical Council

At a recent conference of the Medical Council, Veterans' Administration, the following were elected new members: Drs. Alfred W. Adson, Rochester, Minn.; John Alexander, Ann Arbor, Mich.; John S. Coulter, Chicago; Kendall Emerson and Frederick W. Parsons, New York; Elliott P. Joslin and Harry C. Solomon, Boston; David R. Lyman, New Haven, Conn.; James A. Lyon, Edwin A. Merritt and Winfred Overholser, Washington, D. C., and Lowell J. Reed, Ph.D., Baltimore. A new group, counselors emeritus, was created, composed of Drs. Edward R. Baldwin, Saranac Lake, N. Y.; Sigismund S. Goldwater, New York; Allen K. Krause, Dean Lewis and Winford H. Smith, Baltimore; Joseph W. Schereschewsky, Atlanta, Ga., and Ray Lyman Wilbur, Stanford University, Calif.

Medical Division Established in Federal Trade Commission

Announcement was made, February 8, of the establishment of a medical advisory division in the Federal Trade Commission in Washington to have the same status as other divisions. The director of the new unit will be Dr. Knox E. Miller, senior surgeon, U. S. Public Health Service, who has been on duty with the commission since 1938 as technical consultant to advise on medical and other claims made in advertising of foods, drugs and cosmetics. The medical advisory division will take the place of the medical advisory section and the following personnel in the advisory section has been transferred to the division: Drs. Miller, Charles F. Church and Frederick C. Warnshuis, Miss Beatrice Ruffin and Mrs. Frances Tatum. The change was effective immediately.

Military Medicodental Training Course

The third annual military medicodental training course at Chicago for medical department reserve officers will be held by the sixth corps area March 31-April 13. The course will be conducted under the direction of the corps area surgeon, Col. Paul W. Gibson, with the cooperation of the medical and dental schools of Illinois, Chicago, Loyola and Northwestern universities. It is designed to increase the military and professional proficiency of reserve officers of the medical, dental, veterinary and medical administrative corps. The morning hours will be devoted to professional work in the schools, hospitals and clinics connected with the participating universities. The afternoon and special evening sessions will be devoted to problems connected with the operation and functioning of the medical service in war. The military courses for the current year will be especially concerned with problems of mobilization as they affect the medical department of the army.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 3, 1940.

A Medical Library for the Army in France

The blood transfusion service and surgical research service of the army were initiated by the Royal College of Surgeons through the conservator, Col. John Beattie, and are under his direction. There is a unit in France with its research laboratory, which is under the control of the pathologic curator of the college, and twelve of the college staff work in the laboratory. Colonel Beattie has reported that the unit in France is handicapped by lack of current medical and scientific periodicals. In view of the relations of the college to the army blood transfusion service it has been suggested that the council might establish a library of current periodicals for the use of the unit in France. The *British Medical Journal* has gone further and pointed out that the suggestion of a library for research workers leads directly to the wider possibility—a reference library, which should be available to all officers of the medical service in France.

Tuberculous Patients in Wartime

A previous letter noted the trouble which has arisen from the discharge of tuberculous patients from sanatoriums to make room for the large number of casualties expected from air raids. Mr. Walter Elliot, minister of health, has received a deputation on the subject from the Socialist Medical Association. Referring to the complaint that on the outbreak of war patients had been sent home from sanatoriums when not in a fit state for discharge, he said that this could have arisen only from a misunderstanding of the instructions issued by the ministry. The desire was that every tuberculous patient in need of inpatient treatment should receive it, and instructions had been given to that effect. Since November 1, 125 tuberculous institutions had been released from their obligations to the Emergency Medical Service so that they might devote all their accommodation to their normal functions. More than two thirds of the 28,000 beds provided for the treatment of tuberculosis in England and Wales were still available for that purpose. Since about 3,000 were vacant, the admission of new cases should not present any difficulty.

American Offers of Help for the Wounded

Since the outbreak of war the British medical authorities have received generous offers of help from the United States. Some came from official organizations like the American Red Cross, others from groups of sympathizers with the allied cause and others from individuals. They included offers to establish hospitals in France or England and to provide surgical teams or ambulances and medical equipment. The medical service of the British army has had constantly in mind the experience of the last war and has made plans to deal with the maximum number of casualties calculated by the general staff on the basis of the extent and nature of the military operations to be undertaken, with an ample margin of reserve. Accordingly, every contingent of troops leaving our shores is accompanied by its allotted quota of military hospitals, on the scale laid down, while medical reserves of every description are held in both France and England to meet eventualities.

For the present, therefore, the proffered American help would be most useful not in the form of organized hospitals or of personnel but in the provision of extra medical equipment and stores, including motor ambulance transport, or of funds for the purchase of such supplies and materials. There is an ample supply of British physicians and surgeons of the highest attainments in every specialized branch; indeed, only a proportion of

those who have offered their services could be accepted. Later in the war, when the reserves of hospital accommodation and of medical personnel may be fully drawn on, reinforcements from America would be gratefully received, without overlapping of effort.

The Radiation Treatment of Metastases

At the Section of Radiology of the Royal Society of Medicine, Dr. F. M. Allchin opened a discussion on the treatment of metastases. He said that the attack on them was the crucial point in the treatment of cancer. It was generally acknowledged that in its early stages cancer was a localized disease and could be combated by accepted methods, among which radiotherapy was of increasing importance. To obtain the best results in the treatment of metastases, all forms of treatment should be considered and sometimes two or three forms of radium treatment should be combined. Investigation of the state of the blood before treatment was begun and at regular intervals was important. Sterilization of women under the age of the menopause was of the utmost importance in cases of cancer of the breast. Metastases from breast cancer were always sensitive to radiation, while those from the prostate or the kidney varied in their response. In breast deposits a satisfactory result could often be obtained from small doses, and in his experience large doses were not called for. The scanty literature on the subject suggested that metastases were less responsive to full radiation doses than the primary growth. The response depended, among other factors, on the histologic structure, but in many cases no prediction as to response could be made. Treatment should aim at full doses consistent with the general condition of the patient.

Dr. M. C. Tod said that the methods which might be considered curative were regional therapy for tumors of high sensitivity and localized therapy for those of limited sensitivity. Tumors of high sensitivity were those of embryonal origin, such as seminoma; primitive tumors of unknown origin, such as Wilm's tumor of the kidney; some tumors of the thyroid, salivary glands and nasal accessory sinuses, and tumors of reticulo-endothelial origin, such as lymphosarcoma, thymoma, Ewing's tumor and vascular endothelioma. For highly sensitive tumors, x-ray radiation was always the method of choice. There were four methods of palliation: (1) localized therapy for single sensitive deposits when more foci were present; (2) a growth-restraint technic for resistant tumors; (3) a "chasing technic" (individual treatment of a series of secondaries as they appeared) for secondaries following radical operation for cancer of the breast; (4) symptomatic palliative therapy.

Dr. N. S. Finzi said that in the technic now being followed by Dr. W. M. Levin at St. Bartholomew's Hospital the whole of the trunk was irradiated for some very sensitive deposits, and some striking results were occasionally secured. A number of the patients had now lived five years after treatment of generalized deposits of various radiosensitive tumors. It must not be supposed that there was any high proportion of cures in metastatic cases, but cures did occur.

Electrically Induced Convulsions

Electrically induced convulsions were discussed at the Section of Psychiatry of the Royal Society of Medicine. Dr. Grey Walter read a paper by himself, F. L. Golla and G. Fleming, from the Burden Neurological Institute. He said that during operations in which the brain was exposed a current of from 5 to 10 milliamperes evoked a response but that a hundred times that strength would have to be applied through the scalp. The ordinary 50 cycle alternating current from the mains provided an adequate stimulus that seemed to do no damage. If the first shock failed to produce a major seizure a second might succeed. The electromyographic record was much the same as the records obtained in spontaneous and metrazol convulsions.

Dr. Fleming added some details from the clinical side. At first sight electrically induced convulsions appeared to resemble epilepsy, but there was one important difference: the shock was followed by an immediate start or convulsive movement in all four extremities and then the tonic followed by the clonic phases of the epileptic convulsions occurred. The great objection to metrazol therapy was the latent period before the evocation of the fit, during which the patient was in a condition of intense terror. In the electrically induced seizure there was complete amnesia from the moment of the shock to the end of the convulsions. Again, the intense clonus of the metrazol fit was never observed. Of curative effects he preferred to say nothing at present. But just as with metrazol, some marvelous recoveries had been observed, although the time had not arrived for any assessment of value.

Dr. W. H. Sheply gave his experience in fifty cases treated. The conditions included schizophrenia, agitated melancholia, recurrent mania and hysteria. Some of the patients who had remained well on a maintenance dose (fortnightly) of metrazol showed the same response to electrical therapy. Advantages were removal of anticipatory fear and absence of after-symptoms such as vomiting, confusion and excitement.

Dr. C. R. Birnie took a skeptical view. He objected to the use of the term "therapy" for what was only an interesting piece of research. When metrazol therapy was brought forward at the same section he was one of the few who sounded a note of warning, which had been justified by the recent careful work done in America. An expert committee considered a large number of cases from the point of view of recovery and found that the results were no better than the normal remission rate. This was what psychiatrists might expect. The psychoses which they tried to treat were complicated by the reaction of the personality to the environment. They probably represented the attempt of a failing organism to make an adaptation which must be imperfect. The inhibitions, stupor and depression in many types of schizophrenia were attempts by nature to repress certain unconscious urges with which consciousness was unable to deal. The convulsive treatment released these urges, with which consciousness was no better able to deal than before the treatment.

PARIS

(From Our Regular Correspondent)

Jan. 28, 1940.

War Wounds and Micro-Organisms

Levaditi and his collaborators, relying on observations during the war of 1914-1918, emphasize the frequency of war wound infections by anaerobic germs. He compares the results obtained twenty-five years ago with those of wounds in the present war. In an investigation of all species of micro-organisms found in wounds made by him in the army zone and in the hospitals evacuated for war purposes, 317 samples were taken. The results of this study were presented to the medical academy. Present observations, he said, do not differ much from those taken twenty-five years ago. Thirty-two per cent of the wounds harbored three kinds of micro-organisms, nineteen a single species, nineteen others four species, and twenty-three two, five or six species. Seven were sterile. The species most generally observed were staphylococci (85 per cent), Friedländer's bacillus, *Clostridium welchii*, streptococci, the coli group, the enterococcus and *Bacillus pyocyaneus*. The streptococci showed an increase from 19 per cent in 1917 to 58 per cent in the present count.

The treatment of these infections was improved by the discovery of the azo derivatives, administered orally and in the dressings or by the two methods combined. The intravenous injection of 0.15 Gm. every other day of neoarsphenamine had induced, he said, a more active process of cicatrization. However, it had no noteworthy effect on the microbial curves.

Levaditi isolated twelve stocks of streptococci in the pure state. They were all facultative anaerobes and generally of feeble virulence. Strong doses of p-aminophenylsulfamides applied in situ, in powder form or in glycerin, have had a remarkable prophylactic effect, confirmed by Perrin Long, of Johns Hopkins University. This drug constitutes both a local remedy and a general chemotherapy. It has no direct effect on the germ itself. The results obtained depend on individual resistance.

Knee Sprains

Leriche, speaking before the Academy of Surgeons, stated that knee sprains besides constituting "mechanisms, lesions or clinical aspects" were also often nervous phenomena, an accumulation of vasomotor reactions offering a characteristic clinical picture, without rupture of the ligaments or bone wrenches. Mondor also sought to define knee sprains. Are they simply torsions of the sensitive ends of the ligaments, developing the clinical appearance of edema, inflammation, hydrarthrosis, pain and functional inability or are they anatomic lesions of the ligaments? One does not always find, he said, in the course of primary interventions in knee sprains the classic lacerations of the ligaments. On the other hand, in twenty-eight cases he had observed seven wrenchings away of the spine of the tibia. In a woman aged 32, who had suffered a lesion through the torsion of the coxofemoral joints and who presented the clinical picture of a knee sprain, namely inward swelling, ecchymosis, local inflammation and after that lateral movements, a careful examination of the lesions disclosed a laceration of the patellar extremity and accompanying lesions; in short, a wide transverse injury of from 6 to 7 cm. These lesions were repaired by means of sutures and a reconstitution of the levels, and the limb was placed in a cast. Three years has elapsed, and recovery remains perfect with no functional disorders or joint looseness or osteomas.

This case did not exclude the possibility of concomitant nervous lesions, as Mauclair pointed out. The good results obtained from cocainizations of knee sprains support Leriche's emphasis on the part nervous lesions play in the entirety of symptoms provoked by the knee sprain. Schwartz thought that hemarthrosis which succeeds traumas immediately and the ecchymosis which accompanies them demonstrate tissue lesion and cannot be solely attributed to ganglionic fluxions.

Surgery of the Sympathetic Nerve

In the meeting of the Académie de chirurgie, January 3, the discussion centered round the innervation of the sympathetic nerve. Luzuy reported two almost identical cases of a seton wound in the forearm made by a bullet in which neither the bones nor the large nerve trunks were injured but which caused a complete insensibility of the arm with contraction of the hand and fist that resisted restoration. He diagnosed the condition as one of vasomotor disturbances and decided to operate on the stellate ganglion. A single penetration of the needle brought on Horner's syndrome, justifying the conclusion that a lesion of the sympathetic nervous system was involved. The infiltration of the ganglion promptly restored the contraction and the ischemic disturbances. Ameline thought that perhaps only a traumatic disturbance of the muscular tonus was implicated, the result of hypertonia, in which the "communicating branches" had been paralyzed and that it itself was under the influence of the stellate infiltration.

Welti and Wentz observed Raynaud's syndrome in a woman or, as they designated it, "circulatory disturbances of an ischemic type with digital eschars recalling Raynaud's disease." The left leg was amputated. When ulcerations developed on the stump, three cocainizations of the lumbar plexus were tried, without success. Finally the thigh had to be removed. An eschar formed on the left hand. The ablation of the left stellate ganglion normalized conditions at this point. When ischemia and trophic disorders appeared in the right hand,

stellectomy was performed on this side with an ample perihumeral sympathectomy. On the day of the operation all ischemic symptoms disappeared. Welti and Wentz conclude that stellectomy and the enervation of the sympathetic nerve give good results, provided the operation is done on an ample scale. In one of Ameline's cases enervation was insufficient to maintain improvement for more than six months, probably because the enervation had not been sufficiently extensive.

Pierre Dival reported a case in which resection of the sympathetic nerve of the inferior mesenteric and hypogastric plexus was performed on a boy aged 9 presenting a true giant colon. The megacolon healed but left lesions on the wall of the colon. An intestinal occlusion supervened and an artificial anus had to be made on the right colon and afterward a hemicolectomy in the left side. Dival reported the boy in good health but with two colonic fistulas remaining to heal. According to Thierry de Martel, the role of the sympathetic nerve in organic disorders is to alter functional activity. Secondary lesions that result can be corrected, but the improvement may only too often be temporary.

BERLIN

(From Our Regular Correspondent)

Jan. 20, 1940.

Dietary Kitchens in Berlin

The first so-called ambulatory dietary kitchen has been instituted in Berlin; that is, a station where those in need of special diets can secure noonday and evening meals on medical certification. These kitchens are directed by a governmentally recognized dietetic assistant and supervised medically by the Organization for the Nutrition of the Sick. Patients entitled to this service are either employed or for other reasons are not in the position to make their necessary dietary arrangements. All kinds of diet can be prepared. The noonday meal costs 0.7 mark (28 cents) the evening meal 0.6 mark (24 cents). For more expensive diets an additional charge of 0.25 mark (10 cents) may be made. These dietary kitchens, of which two more are in preparation, are organized by an association of German women in conjunction with the public welfare division of the national socialist party.

Curbing Accidents Due to Drunkenness

Himmeler, chief of German police and head of the SS (schutzstaffeln) under nazism, recently promulgated the following order: Because of the large number of traffic accidents due to drunkenness, intoxicated persons endangering traffic are to be arrested and kept in custody for as many as twenty-four hours. Automobile drivers are to be deprived of driving licenses for a certain length of time. Drivers of other vehicles and bicycle riders can be deprived of their vehicles for two weeks. If such persons have caused an accident and conducted themselves unworthily or if they are habitual drinkers they may be kept for four weeks under police control. The same penalty applies to tavernkeepers if they serve alcoholic beverages to persons already intoxicated. Habitual drinkers whose vice affects the welfare of their dependents must regularly remit to them a part of their income. A vigorous attitude should be assumed in determining what constitutes alcoholic excess in individual cases.

The police department in Memel has ordered that all persons given to immoderate drinking be held in custody until the beginning of the next workday. Before being released, they are to be photographed. Their photographs together with their names are to be publicly displayed for a week. Taverns selling alcohol to drunken persons may be closed by the police.

Vaccines Against Dysentery

True bacillary dysentery (Shiga-Kruse) is rare in central Europe. In 1938 it was imported by migrating workers into Mecklenburg, in northern Germany, and had a 12 per cent

mortality rate. Preventive measures against bacillary dysentery have been inadequate. Recently Prof. R. Otto, director of the Institute for Experimental Therapy at Frankfurt on the Main (founded by Ehrlich and then directed by Kolle), reported on the use of his vaccine in Flexner's dysentery. He was able to curb an epidemic affecting 3,500 men at a military training post. Civilians living in the vicinity who were not vaccinated caught the disease and some died of it. Results like these have not been secured in the Shiga-Kruse dysentery. For this reason the statements of Prof. R. Prigge, a member of the same institute, before the Senckenbergische Naturforschende Gesellschaft, are of great interest. Prigge is known especially for his studies of diphtheria vaccines. In 1937 he announced his dysentery vaccine, which consists of a mixture of bacterial exotoxin with greater neural effects and endotoxin with special action on the intestine. The preparation is now in process of manufacture and is to be ready in the spring. In animal experimentation, excellent results were attained. The first clinical observations also are favorable but require extensive confirmation.

Effects of Seasons and Weather on Influenza

According to Prof. J. Wätjen, of the University of Halle, who investigated the effects of seasons and weather on influenza, there were found at necropsy during the months of February, March and April, after the severe influenza epidemic of the winter of 1936-1937, influenza bacilli in the bronchioles of about 33 per cent of the cases. These investigations were continued for another year until April 1938. Of the 1,370 sections 615, or 45 per cent, were examined bacteriologically. In 181, or 20.4 per cent, bacteria were discovered and in 434, or 70.6 per cent, none. The positive bacteriologic reactions fluctuated markedly in the individual months. A sort of spring peak was recorded from April to June 1937 and a winter peak during December 1937 and January 1938. Only during these two peak periods were also cases of localized pneumonia observed that resembled influenzal pneumonia. The spring peak of 1937 could be connected with the preceding winter epidemic; the increase of positive cases within the winter peak might have been due to the environmental factors. The official meteorologic indications were entered daily and monthly on the records, together with the positive and negative bacillary observations. In consequence, accumulations of positive observations were noted whenever the temperature fell to arctic frigidity. The mere invasion, however, of cold and warm air waves clearly was not sufficient to induce a regular occurrence of positive bacilli. Humidity, wind direction, sunshine and cloudiness exercised no effect. The winter peak of cases is regarded as an accumulation of influenza bacilli incidental to the season. This may be due to the tendency to catch cold when the weather is cold and wet. In spite of an increase of influenza bacilli in the bronchioles, contrary to expectations, no serious epidemic of influenza occurred in the winter of 1937-1938. This proves, according to Wätjen, that the presence of influenza bacilli alone is insufficient, even after penetration, to cause an influenza infection; other factors need to be present to produce influenza.

Personal

Prof Max Borst, professor of pathologic anatomy in Munich, celebrated his seventieth birthday Nov. 19, 1939. He was born in Würzburg and as a pupil of the pathologist Eduard von Rindfleisch laid the foundation of his career there. His excellent contributions, especially in the fields of inflammatory diseases and malignant tumors, soon paved the way for a distinguished academic career, which no doubt was aided by a natural eloquence and the ability of vivid presentation. He was called to Cologne in 1905, to Göttingen in the same year

and to Würzburg in 1906. In 1910 he succeeded von Bollinger in Munich. The new institute promised him at the time was not constructed until much later but is now one of the finest in the world. Borst is the author of a number of books. In 1902 he published the "Atlas of Malignant Tumors" in two volumes, "General Pathology of Malignant Tumors" in 1924 and the chapters on "Pathologic Growth" and "True Tumors" in Aschoff's textbook, which were constantly revised to keep abreast of research. Borst has been president of the state scientific commission for cancer control in Germany. He is not likely to resign during the progress of the war.

Deaths

Prof. Erhard Riecke, formerly professor of dermatology in Göttingen, died in Leipzig at the age of 71 (THE JOURNAL Oct. 14, 1939, p. 1502).

AUSTRALIA

(From Our Regular Correspondent)

Jan. 16, 1940.

The Law Against Abortion

Following the unexplained disappearance of several women during the last two years, the Queensland government continues to tighten the law relating to abortion. The new medical act, gazetted last month, compels practitioners to report immediately both to the police and to the director general of health any case of attempted criminal abortion or any suggestive circumstances. Members of the profession have criticized the act contending that, as it has not attacked the root of the problem, it cannot reduce the primary evil and that, by encouraging a serious breach of confidence between patient and physician, it will serve only to force the existing evil further into obscurity and unskilled hands. Now in an amendment to the health act further wide powers have been given to the police to search for missing women and those suspected of obtaining miscarriage. With or without a warrant from a justice of the peace, police may enter and search any suspected place without even so much as stating the grounds for "reasonable suspicion" and seize as evidence any object that might be used for procuring miscarriage.

Education in Mothercraft

The Mothercraft Association of Queensland in conjunction with the Queensland Nutrition Council has developed an organization whereby a series of lectures and demonstrations in all the wider aspects of mothercraft and homecraft are given annually not only to expectant mothers and young married women but also to girls intending to make homecraft their career. The course is organized in five sections: mothercraft, home nutrition, housecraft, child management and home first aid and home nursing. Each section comprises ten lectures and ten practical demonstrations. The lectures are given by leading medical men and others expert in their particular sphere. The course is excellent and popular. It shows a welcome advance on the teaching of mothercraft as it figures in the syllabus of some secondary schools and evening colleges, merged with many other domestic subjects of doubtful popularity. The Mothercraft Association encourages young girls to take the course, with a view to becoming trained workers in this field, and so able to take over the management of any home at a moment's notice in the event of a mother suddenly being taken ill or wishing to have a holiday away from her family. This idea is being readily accepted in Queensland. Since the outbreak of war, the association has arranged a further series of lectures dealing with a number of subjects related to emergency conditions, including mass feeding, care of large numbers of children in reception areas and substitution food values.

Medical Saga of the Air

For a brief period last week a new headline vied with the war news for the front page of Australian newspapers. A "flying doctor" and his pilot were reported missing somewhere in central Australia. Three days after they had set out from Cloncurry the plane was located, and the doctor and his pilot have now been rescued by a land party. That a flying doctor's plane has been forced down somewhere in uninhabited countryside is nothing new to these men, whose "practices" are lonely spinifex desert and rocky ranges. In eleven years of service, Australia has come to take the saga of the flying doctors somewhat for granted. Today more than 1,000,000 square miles and more than 3,000 people are served by the six medical men whose wings carry them on a 400 mile radius from Port Hedland, Cloncurry, Broken Hill, Kalgoorlie, Wyndham and Alice Springs. Last year, and the Alice Springs station was then barely established, the flying doctors flew nearly 100,000 miles. From the 600 pedal wireless stations scattered through lonely Australian outposts, and the receiving sets at the bases, came 37,554 calls for help for medical advice. Dr. Alberry, flying doctor of the Cloncurry base, who was reported missing last week, has himself circled the earth six times in mileage on his flights to aid outback people.

RISK LIVES FOR PATIENTS

To land where there is no landing ground; to risk his life to reach a patient; to go where no white man has gone before, is nothing new to the doctors of the flying medical service. That is the flying doctor's job. So are all the other hazards that come their way. There have been times when the wing of a plane has formed the roof of their surgery; when, forced down in unknown territory, one or other had had to use all his skill to save his own life and the life of his pilot until help came. It has taken eleven years to complete the structure that an Australian inland mission padre dreamt of in Cloncurry in 1928, and "Flynn of the Island," now moderator general of the Presbyterian church in Australia, has lived to see his dream come true. The cost of maintenance of the six bases alone is more than £25,000 a year. Of this the commonwealth and state governments contribute £9,000. The rest comes from trusts and private donations. Last year the flying doctor service became the Australian Aerial Medical Service. Thanks to the flying doctor and his plane, much of the loneliness, much of the terror has gone from Australia's outback today. They are covering the open spaces of our land with a mantle of medical safety.

Marriages

JOHN EDWARD HOPKINS, Stoney Creek, Ont., Canada, to Miss Celia Teresa Faulhaber, of Clinton, Mich., in February.

ROBLEY CURTIS ALLISON, Petersburg, Va., to Miss Grace Elizabeth Johnson, of Lenoir, N. C., January 20.

WILLIAM MEIER MOODY, Cincinnati, to Miss Patty Alfred, of Covington, Ky., in Lexington, Ky., January 20.

RICHARD RAYMOND SLUCHER, Buechel, Ky., to Miss Mary Emma Hood, of Louisville, in February.

WILLIAM DOTSON WELLS, Paris, Ky., to Miss Susan Ellen Musgrave, of Louisville, January 27.

WALTER E. DANIEL, Charlotte, N. C., to Miss Ada Perry Gibson, of Leesburg, Dec. 30, 1939.

HAROLD GARTNER, Valhalla, N. Y., to Miss Dorothy Mathon, of New York, January 7.

HENRY LEE, Roanoke, Va., to DR. ELIZABETH L. SAUNDERS, of Radford, Dec. 26, 1939.

JOHN R. HILL to Miss Anna Gertrude Griffin, both of Knoxville, Tenn., February 9.

RAY BICKERMAN, Peoria, Ill., to Miss Kathryn Louise Eckert in Chicago, February 3.

Deaths

Martin L. Stevens @ Asheville, N. C.; Baltimore Medical College, 1891; member of the House of Delegates of the American Medical Association in 1907, from 1923 to 1936 and in 1938-1939; past president of the Medical Society of the State of North Carolina and the North Carolina Tuberculosis Association; member of the American Clinical and Climatological Association; fellow of the American College of Physicians; member of the state board of medical examiners from 1914 to 1920; during the World War served as chief of the local medical advisory board; member of the board of directors of the North Carolina Sanatorium and the Western North Carolina Sanatorium; on the staffs of the Ambler Heights Sanatorium, St. Joseph's Hospital and Sunset Heights, Asheville, and Biltmore Hospital and Hillcroft Sanatorium, Biltmore; aged 75; died, January 20, of coronary occlusion.

Raynham Townshend, New Haven, Conn.; Columbia University College of Physicians and Surgeons, New York, 1905; member of the Connecticut State Medical Society; fellow of the American College of Surgeons; at one time assistant in the anatomic laboratory and clinical assistant in surgery, Yale University School of Medicine; served during the World War; attending surgeon to the Hospital of St. Raphael; assistant attending surgeon to the New Haven Hospital; consulting surgeon to the Grace Hospital and New Haven Orphan Asylum; aged 61; died, January 31, of coronary artery disease.

Harry Adolph Davidson @ Louisville, Ky.; Hospital College of Medicine, Louisville, 1899; member of the House of Delegates of the American Medical Association in 1923 and 1926-1927; since 1923 trustee and later secretary of the board of trustees and formerly professor of gynecology and physiology at the University of Louisville School of Medicine; served during the World War; on the staffs of the City Hospital and the Norton Memorial Infirmary; aged 64; died, January 20.

Charles Andrew Ray, Charleston, W. Va.; College of Physicians and Surgeons, Baltimore, 1887; member and past president of the West Virginia State Medical Association and the Kanawha Medical Society; fellow of the American College of Physicians; president of the court of Kanawha County; formerly editor and on the editorial staff of the *West Virginia Medical Journal*; aged 75; medical director of the Kanawha Valley Hospital; died, January 21.

John Henry Bennett @ York, Pa.; University of Maryland School of Medicine, Baltimore, 1892; Jefferson Medical College of Philadelphia, 1893; member of the Radiological Society of North America; at one time city health officer and registrar of vital statistics; formerly member of the board of directors in the city school district; served during the World War; aged 67; on the staff of the West Side Sanitarium, where he died, January 4.

David Walker Basham @ Wichita, Kan.; Kansas City Medical College, 1884; University of the City of New York Medical Department, 1892; member of the Western Surgical Association; fellow of the American College of Surgeons; past president of the Sedgwick County Medical Society; on the staffs of the Wesley Hospital, Sedgwick County Hospital and the St. Francis Hospital; aged 85; died, January 17, of coronary occlusion.

Daniel George Monaghan @ Denver; Denver and Gross College of Medicine, 1903; member of the American Academy of Ophthalmology and Otolaryngology; served during the World War; aged 65; consultant on the staff of the National Jewish Hospital; past president of the staff and later served on the advisory board of St. Joseph's Hospital, where he died, January 17, of atrophic cirrhosis of the liver and arteriosclerosis.

Sambola Jones Couvillon, Moreauville, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1904; member of the Louisiana State Medical Society; parish coroner; for many years member of the parish school board; member of the state board of health; formerly mayor of Moreauville; past president and secretary of the Avoyelles Parish Medical Society; aged 60; died, January 21, in the Touro Infirmary, New Orleans.

John Joseph Cloonan, Stamford, Conn.; College of Physicians and Surgeons, Baltimore, 1897; member of the Connecticut State Medical Society; fellow of the American College of Surgeons; surgeon to Stamford Hospital; consultant to St. Vincent's Hospital, Bridgeport; for many years member of the board of education; at one time bank president; aged 69; died, January 28, of cardiovascular renal disease.

Amos Solon Wheelock @ Goodrich, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; past president of the Genesee County Medical Society; fellow of the American College of Surgeons; for many years member of the school board; surgeon to the Goodrich General Hospital; aged 78; died, January 22, when the automobile in which he was driving was struck by a train.

Manuel Diaz-Garcia @ San Juan, P. R.; Temple University School of Medicine, Philadelphia, 1916; fellow of the American College of Surgeons; medical director of the Clinica Diaz Garcia; consulting surgeon to the Hospital Mimiya, Santurce, Capital City Hospitals, San Juan, and the Municipal Hospital, Rio Piedras; aged 45; died, January 26.

Lorenzo Linn Zimmer, Detroit; Detroit College of Medicine, 1903; member of the Michigan State Medical Society; fellow of the American College of Surgeons; consulting gynecologist to the Receiving Hospital and St. Mary's Hospital; aged 60; died, January 22, in the Providence Hospital of appendicitis.

Clyde Allen Lown, Grand Ledge, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1904; member of the Michigan State Medical Society; aged 69; died, January 20, in the Edward W. Sparrow Hospital, Lansing, of intestinal obstruction, hypertension and arteriosclerosis.

L. Leopold Moser, Jamaica, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1919; member of the Medical Society of the State of New York; on the staff of the Jamaica Hospital; aged 47; died, Dec. 20, 1939, in the Jamaica Hospital of coronary thrombosis.

Charles Clifton Buchanan, Hattiesburg, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1909; member of the Mississippi State Medical Association; served during the World War; aged 52; died, January 22, in the Methodist Hospital of bronchopneumonia.

Edward A. Mattoon, Sapulpa, Okla.; Jefferson Medical College of Philadelphia, 1875; at one time superintendent of the Denver and Rio Grande Western Railroad Hospital, Salida, Colo., and the Okmulgee (Okla.) City Hospital; aged 91; died, Dec. 24, 1939, of a fracture of the hip.

Charles Nash Dawson, Black Earth, Wis.; Washington University School of Medicine, St. Louis, 1925; member of the State Medical Society of Wisconsin; served during the World War; aged 41; died, Dec. 26, 1939, in Beloit of intestinal hemorrhage and cirrhosis of the liver.

Walter Clark Montgomery, New York; Columbia University College of Physicians and Surgeons, New York, 1900; formerly assistant professor of clinical surgery, Cornell University Medical College; served during the World War; aged 61; died, January 15, of heart disease.

William Shelby Sanders, Troy, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1892; member of the Medical Association of the State of Alabama; formerly physician to the Troy State Teachers College; aged 71; died, January 13, of coronary thrombosis.

Frederick Cook, Seattle; Northwestern University Medical School, Chicago, 1903; member of the Washington State Medical Association; aged 61; died, January 2, in the Western State Hospital, Fort Steilacoom, Wash., of bilateral bronchopneumonia and diabetes mellitus.

Thomas O. Kirkpatrick, Lowndesville, S. C.; Tennessee Medical College, Knoxville, 1899; member of the South Carolina Medical Association; past president of the Abbeville County Medical Society; aged 71; died, January 19, of multiple sclerosis and bronchopneumonia.

General Sherman Wilson, Fortuna, Mo.; Barnes Medical College, St. Louis, 1899 and 1901; member of the Missouri State Medical Association; past president and secretary of the Moniteau County Medical Society; aged 64; died, January 7, of coronary thrombosis.

James Clarence Sartor, Rayville, La.; University of Louisville (Ky.) Medical Department, 1909; member of the Louisiana State Medical Society; member of the state board of health; served during the World War; aged 57; died, January 4, of coronary occlusion.

Ernest H. Bohland @ St. Paul; Medical Department of Hamline University, Minneapolis, 1903; on the staffs of St. Luke's Hospital, St. Joseph's Hospital, Charles T. Miller Hospital and Children's Hospital; aged 65; died, January 10, of acute endocarditis.

Roy Calvin Kitchell @ Sullivan, Mo.; Chicago Medical School, 1922; served during the World War; aged 48; died, January 4, in the Veterans Administration Facility, Jefferson Barracks, of peritonitis following an operation for appendicitis.

Horace Plummer Wilson @ Whittier, Calif.; Northwestern University Medical School, Chicago, 1896; fellow of the American College of Surgeons; served during the World War; aged 68; died in December 1939 of coronary heart disease.

Henry J. Off, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1896; since 1939 emeritus professor of otology at the Temple University School of Medicine; aged 65; died, January 28, of coronary infarct.

William Brewer @ Woodbury, N. J.; Jefferson Medical College of Philadelphia, 1896; past president of the Gloucester County Medical Society; owner of a hospital bearing his name; aged 74; died, January 28, of carcinoma of the liver.

Cary Stewart Wilson, Soso, Miss.; Memphis (Tenn.) Hospital Medical College, 1909; member of the Mississippi State Medical Association; aged 54; died, January 3, in a hospital at Laurel of hemorrhage due to gastric ulcer.

Oluf F. Carlson, Fort Worth, Texas; Fort Worth School of Medicine, Medical Department of Texas Christian University, 1897; aged 74; died, January 23, in the Cook Memorial Hospital of cerebral thrombosis and lobar pneumonia.

Samuel Richard Volpe, New York; Cornell University Medical College, New York, 1936; resident physician to the Bellevue Hospital; aged 28; was found dead, January 23, of hanging and self-incised wounds of the wrists.

C. V. Arthur Weichelt, Barrington, Ill.; Jenner Medical College, Chicago, 1900; served during the World War; aged 70; died, January 4, in the Veterans Administration Facility, North Chicago, of cerebral arteriosclerosis.

Philip Doddridge Lipscomb @ Richmond, Va.; University of Virginia Department of Medicine, Charlottesville, 1900; aged 69; died, January 4, of injuries received when he was struck by an automobile while crossing the street.

James Oscar Wickerham, Rockford, Ohio; Starling Medical College, Columbus, 1897; served during the World War; aged 75; died, January 14, in a hospital at Van Wert of a fracture of the hip received in a fall.

James G. MacGregor, Boyne City, Mich.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1895; member of the Michigan State Medical Society; aged 77; died, January 16, of cerebral hemorrhage.

Frederick Henry Brown @ Billings, Mo.; Barnes Medical College, St. Louis, 1899; served during the World War; aged 63; died, January 4, in the Springfield (Mo.) Baptist Hospital of carcinoma of the stomach.

Henry Clermont Miller, Bradenton, Fla.; Hahnemann Medical College and Hospital, Chicago, 1898; served during the World War; aged 69; died, January 9, of arteriosclerosis and hypertrophy of the prostate.

Albert William Nelson @ Battle Creek, Mich.; American Medical Missionary College, Chicago, 1903; fellow of the American College of Physicians; aged 61; died, January 5, of cerebral hemorrhage.

Thomas C. W. Ellis, Amite, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1891; at one time health officer of Tangipahoa Parish; aged 71; died, January 20, of angina pectoris.

Chester James Teass @ San Luis Obispo, Calif.; Cooper Medical College, San Francisco, 1897; fellow of the American College of Surgeons; aged 65; died, Dec. 23, 1939, of carcinoma of the esophagus.

James Erwan Hardaway, Lynn, Ark. (licensed in Arkansas in 1903); member of the Arkansas Medical Society; aged 67; died, January 4, in a hospital at Batesville of myocarditis and chronic nephritis.

Lawrence Anthony Zinsmeister, Sprout, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; aged 60; died, January 12, in the Memorial Hospital, Cumberland, Md., of heart disease.

James Harrison Rachels, Danville, Ill.; Meharry Medical College, Nashville, Tenn., 1908; aged 60; died, January 16, in St. Elizabeth Hospital of a ruptured esophagus resulting from hiccoughs.

Peter Arthur Schulberg, Durand, Wis.; University of Illinois College of Medicine, Chicago, 1914; aged 49; died, Dec. 29, 1939, in Butte, Mont., of chronic nephritis and cerebral hemorrhage.

Charles Brentano Wagner, Chicago; Chicago Medical College, 1888; on the staff of the Evangelical Deaconess Hospital; aged 74; died, January 18, in the Illinois Masonic Hospital of pneumonia.

Judge B. Pittman, Crenshaw, Miss.; Louisville (Ky.) Medical College, 1889; aged 72; died, January 21, in the Methodist Hospital, Memphis, Tenn., of coronary sclerosis and hemiplegia.

Augustus S. Warner @ Chicago; Northwestern University Medical School, Chicago, 1895; aged 71; died, January 18, in the West Suburban Hospital, Oak Park, Ill., of coronary thrombosis.

J. Lyman Hutchinson, Tacoma, Wash.; University of Buffalo School of Medicine, 1901; member of the Washington State Medical Association; aged 62; died, January 6, of coronary occlusion.

Theodore W. Singer, Louisville, Ky.; Cleveland Medical College, 1853; veteran of the Civil and Spanish-American wars; at one time deputy coroner; aged 104; died, January 3, of pneumonia.

John Milton Ryall Jr., Braddock, Pa.; Temple University School of Medicine, Philadelphia, 1937; aged 30; resident physician to the Braddock General Hospital; died, Dec. 14, 1939.

Isaac Lee Dowdey, Boaz, Ala.; Chattanooga Medical College, 1903; served during the World War; aged 66; died, January 24, in a hospital at Gadsden of cerebral hemorrhage.

Thomas R. Loer, Seattle; College of Physicians and Surgeons, Keokuk, Iowa, 1896; member of the Washington State Medical Association; aged 70; died, January 4, of pneumonia.

Charles Augustus Dodson, Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1911; aged 65; died, January 8, of cerebral hemorrhage and hypertension.

Nathaniel L. Drunert, Truxton, Mo.; St. Louis College of Physicians and Surgeons, 1889; aged 77; was found dead, January 1, of diabetes mellitus and coronary artery disease.

Stonewall W. Johnson, Sullivan, Ill.; Homeopathic Medical College of Missouri, St. Louis, 1887; formerly mayor and health officer; aged 76; died, January 19, of chronic nephritis.

Frank Cook, Springfield Lake, Ohio; Ohio State University College of Medicine, Columbus, 1931; aged 32; died, January 22, in the Edwin Shaw Sanatorium, Akron, of tuberculosis.

George Smith Williams, Syracuse, N. Y.; University of the City of New York Medical Department, 1890; aged 82; died, Dec. 5, 1939, of cerebral hemorrhage and arteriosclerosis.

Edward Kilbourne Roberts, Los Angeles; Yale University School of Medicine, New Haven, Conn., 1880; aged 82; died, January 15, in Simsbury, Conn., of chronic myocarditis.

Joseph Vincent Burns, Coaldale, Pa.; Jefferson Medical College of Philadelphia, 1915; served during the World War; aged 51; died, Dec. 31, 1939, of coronary thrombosis.

James W. De Jarnatt, Quitman, Ark.; University of Arkansas School of Medicine, Little Rock, Ark., 1905; aged 68; died, January 23, at Conway of cerebral hemorrhage.

George Francis Van Pelt @ Gordon, Ohio; Medical College of Ohio, Cincinnati, 1898; aged 70; died, January 24, in the Good Samaritan Hospital, Dayton, of pneumonia.

Grant Meyer, Marion, Kan.; Central Medical College of St. Joseph, Mo., 1896; member of the Kansas Medical Society; aged 71; died, Dec. 22, 1939, of cerebral hemorrhage.

William Hammond Ashby, Lewisport, Ky.; Hospital College of Medicine, Louisville, 1904; aged 62; was found dead, January 24, of a self-inflicted bullet wound.

Richard Douglas Keller, Greeneville, Tenn.; University of Tennessee Medical Department, Nashville, 1894; aged 71; died, January 3, of cerebral hemorrhage.

William Utteridge Cole, Columbus, Ohio; Starling Medical College, Columbus, 1890; aged 78; died, January 18, in the Grant Hospital of cardiorenal vascular disease.

Edwin Jacob Knerr, Wyoming, R. I.; Starling Medical College, Columbus, 1895; formerly senator; aged 69; died, January 15, of carcinoma of the rectum.

Claudius A. Gavin, New Port Richey, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1911; aged 55; died, January 6, of pulmonary tuberculosis.

William Andrew Gowing, Toledo, Ohio; Toledo Medical College, 1898; served during the World War; aged 68; died, January 17, of coronary thrombosis.

Clarence N. Ferguson, Chapel Hill, Tenn.; University of Tennessee Medical Department, Nashville, 1891; aged 71; died, January 13, of cerebral hemorrhage.

William Bowers Watts, Atlanta, Ga.; University of Georgia Medical Department, Augusta, 1889; aged 74; died, January 20, of cerebral hemorrhage.

Bureau of Investigation

POST OFFICE BANS A "PILE CURE"

"Pilocura," Alleged Brazilian Discovery, Is Declared a Fraud

A nostrum business operating from Washington, D. C., under the trade style "Pilocura Company, Inc.," has been declared fraudulent by the Post Office Department and debarred from the mails. Its principal promoters were a Paul W. DeLoe and his wife, Jane B. DeLoe.

These persons appeared at a hearing of the case which consumed an entire day. At the conclusion the DeLoes' counsel obtained permission to submit a brief, to which Hon. Vincent M. Miles, Solicitor for the Post Office Department, gave due consideration before recommending to the United States Postmaster that a fraud order be issued against the concern. Some of the information brought out by Judge Miles in his memorandum follows:

The business was started in 1912 by Mrs. DeLoe and incorporated in Delaware in 1932. At the time of the Post Office investigation Paul DeLoe was president and his wife Jane was secretary and treasurer. From 1932 on no newspaper advertising had been done, but since March 1938 circulars had been mailed to about 2,500 persons, whose names were purchased from a Chicago letter broker and a concern called M. Royds Company, of Kansas City, Mo. In this connection it is interesting to note that in October 1938 the M. Royds Company and its alias, Hugo Remedy Company, were debarred from the mails for conducting a fraudulent "pile cure" scheme and a "kidney and bladder cure." It is easy to believe that their "sucker lists" would be useful to the Pilocura concern.

The memorandum further brought out that not only were the DeLoes without medical training but also that no physicians, chemists or pharmacists were connected with the business. The treatment originally was sold over drug store counters as a liquid under the names "Safe Vegetable Compound" or "SVC." Jane DeLoe was said to have claimed that the product had come to her attention in 1902 or 1903 when she was visiting in Norfolk, Va. There, she said, her colored maid took something that a friend recommended for "piles" and in three days they were gone. So impressed was Mrs. DeLoe, she said, that she made another trip to Norfolk, where she learned that the preparation was sold by "a little German doctor" who told her he had bought it twenty-five years previously on a trip to Brazil. He claimed, she said, that its efficacy depended on a certain herb unknown in this country. Mrs. DeLoe related that she prevailed on him to sell her the formula for \$250 on the promise that she would not make it public during his lifetime.

Mrs. DeLoe described the "cure" as originally obtained by her maid as a bad-tasting, evil-smelling, sticky brown liquid, composed of seven ingredients and 25 per cent of alcohol. The mixture was known as "South American Herb Remedy." Mrs. DeLoe testified that after selling it in this form for a time through drug stores she had it analyzed by a "Dr. Kalusowski" (no such name appears in the American Medical Directory) and asked him to revise the formula so as to make it "really effective." On his advice she eliminated the alcohol and three of the ingredients, whose names she had forgotten, reduced the remaining constituents to tablet form and changed the name to "Pilocura." She added that she had not intended this title to mean "pile cure" but merely that it "struck her as a nice little name."

Advertising circulars introduced at the hearing contained not only the company's claims but a number of testimonials, to most of which only initials were signed. One inquirer received from the company a typewritten letter reading in part:

"During the past several years we have come up against a great number of desperate cases of piles, as the enclosed circular will indicate. If you will give PILOCURA a fair trial we believe you will be satisfied that an operation will be unnecessary. We are enclosing a letter which may also be of interest to you."

The Solicitor's memorandum reported that examination of the Pilocura tablets, prepared by Burroughs Bros. Mfg. Co., Baltimore, showed that each consisted essentially of large amounts of licorice and rhubarb, as well as some yerba santa and buck-

thorn (frangula). It was surmised that the yerba santa represented the "little known" Brazilian herb which the promoters of Pilocura played up as one of the ingredients. The DeLoes' only medical witness, named as a Dr. Howard Hume, testified that the yerba santa "is supposed to be an alterative and build up the general health" and "seems to be the most important thing" in the preparation. However, his testimony as to its effect on the human system placed it in the same class with the three other ingredients as a "mild laxative" and he was unable to explain how it allegedly affected the general health. The government's two medical experts testified that yerba santa was used principally as a flavoring ingredient in certain preparations and, except for such slight laxative effect as it might produce in connection with the other ingredients, it was therapeutically worthless as used in Pilocura.

The government's medical evidence showed further that the basic causes of hemorrhoids are many and varied and that frequently the conditions and their accompanying pains disappear without resort to medication. Also this evidence brought out that the only treatment that will replace or restore to normal the tissues in the rectal veins that have been damaged by chronic, recurrent hemorrhoidal attacks is either surgery or injection of sclerosing materials in and about the walls of the veins. Further expert testimony was presented to show that such treatments as Pilocura may irritate and aggravate the hemorrhoidal tissue instead of healing it.

In October 1938 it was reported that a "Dr. Jane B. Coates" was connected with the Pilocura Company in Washington. No record of her could be found in the American Medical Association's files, but in the Washington telephone book ("Summer-Fall 1937") there was listed a "Rev." Jane B. Coates. In the current issue of that directory ("Summer-Fall, 1939") "Rev." Jane B. Coates is shown at "1810 Ont. Pl. N.W.," which is the same address (and has the same telephone number) as is given for "Rev." Paul W. DeLoe, one of the Pilocura promoters. The Pilocura Company is not listed. One cannot help wondering whether "Dr." or "Rev." Jane B. Coates and Mrs. Jane B. DeLoe are not one and the same person.

All in all, the Solicitor found from the evidence presented that the Pilocura business was "a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises" and on his recommendation a fraud order debarring it from the mails was issued on March 24, 1939, against the concern under its several "Pilocura" designations and against the officers and agents as such.

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Elco Cold Treatment.—Erie Laboratories, Cleveland. Composition: Approximately 2.8 grains of phenacetin and 0.7 grain of acetanilid per capsule. Misbranded because these drugs were declared in false amounts on bottle label and not declared at all on the carton as to presence and quantity.—[N. J. 30229; June 1939.]

Furmas.—Erie Laboratories, Cleveland. Composition: Essentially a mixture of magnesium hydroxide and carbonate, sodium and potassium carbonates and/or bicarbonates, a water-soluble red substance, peppermint oil and water. For acidosis, dyspepsia, functional stomach disorders, headaches, sleeplessness, nervousness, dizziness, etc. Fraudulent therapeutic claims.—[N. J. 30229; June 1939.]

Mrs. Bee Health Anodyne Capsules.—Erie Laboratories and Mrs. Bee Health Laboratories, Cleveland. Composition: Essentially phenacetin, aspirin and caffeine. For painful menstruation. Fraudulent therapeutic claims.—[N. J. 30229; June 1939.]

Mrs. Bee Hypo-Tonic Pills.—Erie Laboratories and Mrs. Bee Laboratories, Cleveland. Composition: Chiefly plant material, coated with sugar and iron oxide. Fraudulently represented as a system tonic and nerve sedative for rundown, irritable women.—[N. J. 30229; June 1939.]

Prescription 333.—Erie Laboratories, Cleveland. Composition: Essentially aspirin and sodium salicylate. Fraudulently represented as a prompt relief of pain caused by lumbago, neuralgia, gout, arthritis, sciatica, neuritis and swollen joints.—[N. J. 30229; June 1939.]

Correspondence

TREATMENT OF BITES OF RABID ANIMALS

To the Editor:—Permit me to refer again to the question of treatment of bites by rabid animals, which was covered under Queries and Minor Notes on page 1434 of THE JOURNAL, Oct. 7, 1939.

Since the Pasteur treatment is not 100 per cent effective, by reason of its inability to protect against more than one to three minimal infective doses or to develop the requisite degree of immunity in cases in which the incubation period is short, any other form of treatment which holds out any hope at all of exerting a preventive influence must be applied. The only other treatment at present available is the cautery, either actual, as in the days of Pasteur, or by nitric acid, as at present. The rationality of this procedure can be readily appreciated by a consideration of certain facts concerning virus invasions, particularly the invasion of rabies. Any one who has ever tried to stop a smallpox vaccination take by scrubbing with soap and water or even iodine will appreciate the need of a destructive agent—destructive alike to the tissues and to the still superficial virus. That the virus of rabies remains for a reasonable time in the wound and is not carried away rapidly by the lymphatics is an indisputable fact. The observations of McMaster and Hudack, referred to in the editor's answer to the correspondence and which reveal the speed with which particulate matter is carried away by the lymphatics, are not applicable to rabies. Any rabies virus which may be taken up by the lymphatics is for that very reason rendered *hors de combat*, since the evidence is that rabies virus so introduced is not effective. Rabies cannot be produced experimentally by introducing large quantities into milk, fed to susceptible animals. The disease is never produced by consuming the milk of rabid animals, although the virus, it is said, has been demonstrated in milk. I have inoculated a thousand minimal infective doses of fixed virus subcutaneously in rabbits without producing infection.

The port of entry of the rabies virus in nature is not the lymphatics or the blood stream but the nerves. It is by way of the nerve trunk that the virus travels from the smaller branches in the superficial tissues to the cord and brain. The rate of travel is slow, which accounts for the long incubation period of the disease. The reason for shorter incubation periods when the inoculation is near the brain is thus made clear. While it is true that experimental infection can be produced by intravenous inoculation, the doses are enormous relative to the natural method by an animal's bite, and the results of such inoculations are uncertain and irregular. There is no evidence that natural infection ever occurs by way of the blood stream. Animals survive experimental nerve inoculations when the nerve trunk central to the site of an inoculation is resected, while the resected nerves themselves are infective. It has also been shown that the portion of the spinal cord in connection with an infected nerve becomes infective before the rest of the central nervous system (Marie et al., 1927). Even the infectious quality of saliva is not due to any involvement of the salivary gland tissue but to the presence of neurons, which may occur as single cells or as ganglionic aggregations and which are seated just under the epithelium, the virus being set free from the neurons by abrasion of the epithelium (Topley and Wilson). The virus may spread centrifugally from the brain and be found in such nerves as the brachial and the sciatic (Nicolau and Galloway, 1928).

Not only does fuming nitric acid destroy both tissues and virus on the surface with which it comes in contact but the effect penetrates for a limited but appreciable depth. The contention that one cannot reach absolutely all corners which harbor virus and that for this reason cauterization is useless is without merit. The importance of dosage in relation to the chance of successful infection in all diseases is well known. The principle is of manifold importance in rabies, in which the vaccination treatment is capable of generating a resistance against only a limited amount of virus. It is therefore most essential that the specific treatment be aided by a reduction of the force it has to combat, and this aid is effectively given by thorough cauterization of the wound. Cauterized wounds heal readily, and considerations of scarring have no weight whatever. Indeed, a bite on the face, in which case cauterization is most likely to be withheld because of the fear of scarring, is precisely the one, above all others, which requires thorough treatment, for reasons previously referred to.

As between prompt and thorough cauterization and the Pasteur treatment, there is a question as to which used alone would be the more effective. In my opinion, if all the facts were known it would be found that cauterization is the more valuable. The various estimates of the percentage of successes of the vaccine treatment are subject to considerable modification, because of the many unknown factors which tend to swell the number of cases that should not be included in the series. These include such things as the amount of virus introduced (only one out of six persons develops rabies without treatment), injury of nerves, bites through clothing and the question of rabies in the dog. Everything considered, the omission of cauterization by a physician who knows these facts is a dubious performance.

W. H. KELLOGG, M.D., Berkeley, Calif.

Chief, Division of Laboratories, State of California Department of Public Health.

TOXIC HEPATITIS AFTER CINCHOPHEN

To the Editor:—In the article "Toxic Hepatitis and Acute Yellow Atrophy Following Medication with a Cinchophen-Containing 'Cold Cure'" by Cyril M. MacBryde, which appeared in THE JOURNAL on January 27, the author states in his summary (p. 318) that he "was unable to find any previous reports of ulcers caused by cinchophen in the human being, although peptic ulcers have been so produced in experimental animals." Evidently our papers (Gastric Ulcers Associated with Cinchophen Poisoning: Report of an Instance with Consideration of the Possible Etiologic Relationship, *Am. J. Digest. Dis. & Nutrition* 1:29 [March] 1934; Cinchophen Poisoning: A Report of Seven Cases with Special Reference to a Rare Instance Complicated by Multiple Gastric Ulcers, *ibid.* 1:434 [Sept.] 1934) escaped the author's attention. Based on the original experimental work of Van Wagoner and Churchill (*Proc. Soc. Exper. Biol. & Med.* 28:581 [March] 1931; *Arch. Path.* 14:860 [Dec.] 1932), we suggested and discussed the probable relationship between cinchophen poisoning and the finding of gastric ulcers in a patient who had been under our observation. A careful search of the literature at that time revealed one other similar case reported by Reah (Cinchophen Poisoning, *Lancet* 2:504 [Sept. 3] 1932), but the possible relationship of peptic ulcers to cinchophen intoxication had received no consideration. Hence an abstract of Reah's case was included in our paper. In our summary we "suggested that a careful anamnesis in all peptic ulcer patients from the standpoint of cinchophen therapy might yield interesting data."

LEON BLOCH, M.D.

DAVID H. ROSENBERG, M.D.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DERMATITIS FROM SALT WATER BATHING

To the Editor:—In a camp situated on the Florida Keys I have observed that, after a group of men have been here for from four to eight weeks, 50 per cent develop a papulopustular dermatitis, which is localized mainly in the axilla, usually bilaterally and concomitant. There are no other signs or symptoms nor elevation of temperature. In this region it is commonly known as "salt water itch" and believed to be the result of constantly bathing with salt water and being exposed to the salt vapor laden air. Therapeutic attempts with calamine lotion, salicylic alcohol, ammoniated mercury and the like have been moderately successful in drying up the lesions. There have been but few cases of secondary infection. The problem is more one of prevention than of treatment, for in a camp of this kind a situation of this nature is detrimental to the morale of the men. Could you advise or refer me to the proper prevention of this dermatitis other than attempting to go over to fresh water bathing, which is unfortunately an impractical solution in this locality?

Henry B. Dubins, M.D., Ramrod Key, Fla.

ANSWER:—Salt water alone does not commonly produce any irritation or infection. It is possible that some tropical plant or minute animal may cause such a dermatitis, with a low grade secondary infection. The best answer, of course, would be fresh water and soap, but it is realized that this is not practical on a Florida key. The use of a 75 per cent alcohol in saturated boric acid solution is suggested for routine use after bathing. It is possible that Burow's solution (aluminum acetate) in a dilution of 1:20 or 1:10 might also prove of help. Whether the protection obtained by having each individual go over his body with an oily solution, either olive oil, coconut oil or petrolatum, would be of benefit is a question. Perhaps the addition of boric acid to the protective solution or the use of boric ointment, applied previous to bathing, might also be helpful. Of course this is messy and may not appeal to the individuals concerned.

HERPES ZOSTER OF TRIGEMINAL NERVE

To the Editor:—About four years ago a patient, now 30 years of age, complained of pain in the right supra-orbital division of the fifth nerve which became increasingly severe, with a dull constant burning, varying only in intensity. The pain was present in the right frontal area of the scalp, with one area on the right parietotemporal region of the scalp, at which point there was a cutaneous lesion, diagnosed by a competent dermatologist as herpes. This lesion was excised, and the pathologic report indicated a chronic inflammatory process. There are herpetiform lesions on the right frontal area of the scalp also, which have appeared from time to time since the onset of pain. No sedatives give relief, not even morphine sulfate 1 grain (0.06 Gm.) when the pain is severe. Trichloroethylene and chloroform do not help. Roentgenograms have been taken of the teeth, revealing no impacted molars and clear sinuses. Stereoroentgenograms of the skull are normal, some calcification appearing in the right choroid plexus only. The encephalogram and results of spinal fluid examination, including reactions to the Wassermann and the pressure test, were normal. No drugs or combination of drugs completely remove the pain, which at present is more bearable than formerly. I have discussed this case with a neurosurgeon, who says that avulsion of the right supra-orbital nerve will completely rid the patient of this pain. How serious is avulsion of the supra-orbital nerve? The patient was told that it could be done with local anesthesia, yet he was advised to enter the hospital the night before the operation. This frightened him greatly, as it indicates a serious operation—to his mind. He was under the impression that he could walk in the same morning, go to the operating room, undergo the necessary surgical procedure and be at home in two or three days. Kindly advise me whether in your opinion avulsion of the supra-orbital nerve will rid the patient of his pain. How serious is this procedure? Is there any other treatment that can be advised in this case? The pain completely incapacitates the patient. What are the after-effects of avulsion of the supra-orbital nerve?

M.D., New York.

ANSWER:—The condition described is doubtless herpes zoster of the trigeminal nerve, manifest peripherally in the area of supply of the ophthalmic division of that nerve. The cause of such herpes is probably the same as that of herpes zoster in the spinal nerves; that is, a low grade, chronic, usually non-destructive inflammation on an unknown basis. Histologically the changes in the gasserian ganglion have been shown to be the same as those in the dorsal spinal ganglions, to which the gasserian ganglion is anatomically analogous. A causative virus has been postulated but never isolated. Such an affliction must

always be carefully differentiated from major trigeminal neuralgia, and when the herpes is in the ophthalmic division, as here, there is always the danger of vesicle formation with resultant scars in the cornea.

Avulsion of the supra-orbital nerve is a minor operation and may be accomplished easily under simple procaine hydrochloride anesthesia with a minimum of preoperative and postoperative hospitalization. A small incision through the eyebrow is the site of choice for the operation.

In this case avulsion of the supra-orbital nerve would probably give relief if the pain and herpes are entirely within the area of supply of that nerve. Such an operation is worth trying. But it must be remembered that the pain of herpes trigeminalis may be centered in the pons, so that even section of the posterior root will give no relief.

High voltage roentgen treatment of the gasserian ganglion has been suggested but is not noteworthy for its results, and avulsion of the nerve is the usual procedure.

After avulsion of the nerve, the area of supply will be anesthetic to light pain, light touch, heat and cold stimuli. After a few months, when the nerve has again grown out, sensation will be reestablished and the pain may or may not recur.

PAPAVERINE IN ASTHMA, ANGINA AND COLDS

To the Editor:—I should like to know whether papaverine is of any special value or of greater value than the usual drugs used in bronchial asthma, angina pectoris and head colds (in combination with codeine as, for instance, Copavin-Lilly). Can papaverine be procured in one-half grain tablet form?

M.D., Iowa.

ANSWER:—Papaverine exerts a peripheral depressant action on the contractions and tonus of all kinds of smooth muscle. Its peripheral effect includes lowering of intestinal tonus, lowering of high blood pressure by vasodilatation and increase in coronary circulation. Primarily because of its effectiveness in spastic conditions of the gastrointestinal tract and other hypertonic conditions (biliary colic, bronchial spasm and in the diagnosis of pylorospasm), papaverine is included in New and Nonofficial Remedies. With less reason it has been tried in hypertension, angina pectoris, vomiting, gastric crises, asthma and whooping cough. Most authorities do not include papaverine as a remedy for the latter.

The successful use of the opiates in the treatment of common colds has been reported by H. S. Diehl (Medicinal Treatment of the Common Cold, *THE JOURNAL*, Dec. 23, 1933, p. 2042). Copavin is the proprietary name under which Eli Lilly & Co. markets under license of the University of Minnesota a mixture of codeine sulfate and papaverine hydrochloride one-fourth grain (0.016 Gm.) each. Since both of these ingredients are official in the U. S. Pharmacopeia XI and National Formulary VI, the Council on Pharmacy and Chemistry has failed to see the justification for a proprietary name or patent to control their combination, as the use of opium (Dover's powder) in the treatment of colds is not new.

Papaverine hydrochloride alone can be procured in tablets of any dosage when prescribed by a physician possessing a narcotic license. The average dose is stated as 1 grain (N. F. VI). Papaverine or codeine alone is relatively nontoxic in therapeutic doses, but together the presence of the former may potentiate the action of codeine (Possible Symptoms from Copavin, *Queries and Minor Notes*, *THE JOURNAL*, April 16, 1938, p. 1304).

EOSINOPHILIA AND SULFAPYRIDINE

To the Editor:—Two patients treated with sulfapyridine experienced an eosinophilia of from 8 to 10 per cent shortly afterward. They did not have this eosinophilia before sulfapyridine was started. Can the use of sulfapyridine explain the eosinophilia? Doses were about 100 grains (6.5 Gm.) a day.

Raymond H. Goodale, M.D., Worcester, Mass.

ANSWER:—There are no controlled published observations indicating that sulfapyridine may cause an eosinophilia in human beings. P. O. Hageman (*Proc. Soc. Exper. Biol. & Med.* 37:119 [Oct.] 1937) has noted that in mice which received azosulfamide (neoprontosil) over a period of two weeks, large numbers of eosinophil leukocytes were found in the bone marrow at necropsy. Kreutzmann and Carr (*ibid.* 38:19 [Feb.] 1938) noted that moderate doses of azosulfamide given to rabbits for a period of three weeks produce an increase in the stippel cells and eosinophil leukocytes in these experimental animals. Hence it is possible in the two cases in which an eosinophilia was noted in the course of the use of sulfapyridine that this change in the leukocytes was due to the administration of the drug.

ALLERGY TO VEGETABLE OILS

To the Editor:—One of my patients has proved hypersensitive to sesame oil, peanut oil, olive oil and most of the vegetable oils. Will you kindly advise what vehicle could be used to dilute the sesame oil, for instance, in order to desensitize this patient against it?

M.D., Texas.

ANSWER.—The query is rather indefinite, as it does not state how the oils were administered. These oils are, of course, used both by mouth or as a vehicle for administering medication intramuscularly. It is difficult to desensitize against an oil, although some work along this line has been done with the oil fraction of poison ivy, ragweed and burweed marsh elder.

In these cases dilute injections have been given with increasing doses for the purpose of raising the resistance of the patient. The results of such treatment are in dispute, with both favorable and unfavorable reports in the literature.

A more logical method would be to substitute some other edible oil for the one to which the patient is sensitive. In a paper entitled "Animal and Vegetable Fats and Oils," U. S. Dept. of Commerce Bureau of the Census, 1937, the following edible oils are listed, any one of which can be taken as a substitute for the one the patient cannot tolerate:

Cottonseed oil	Peanut oil	Coconut oil
Corn oil	Soybean oil	Olive, edible
Palm-kernel oil	Rapeseed oil	Palm oil
Sesame oil	Sunflower oil	Babassu oil
Oleo oil	Fish oils	Tallow, edible

There is also some question as to whether any one is really sensitive to any pure oil which is free from protein. Patients who are sensitive to materials which contain both an oil and a protein are sensitive to the protein fraction and not to the oily part; therefore if the oil is entirely free from protein it should give no symptoms whatever. In support of this is the paper read by Harry S. Bernton, M.D., Joseph R. Spies, Ph.D., and Henry Stevens, Ph.D., on the "Significance of Cottonseed Sensitiveness" before the American Association for the Study of Allergy in June 1939. They have definitely shown that patients are sensitive to cottonseed protein and not at all to cottonseed oil U. S. P. Contact dermatitis, however, may be due to the oily fraction of plants and other substances. The protein fractions may be responsible for bronchial asthma, allergic rhinitis, atopic dermatitis, migraine and other typical allergic conditions.

TRAUMA AND RETRODISPLACEMENT OF UTERUS

To the Editor:—A woman aged 25 was riding on July 31, 1938, in the rear seat of an automobile which was struck by another car from the rear. On the following day she complained of some headache, stiffness of her neck, and backache. There were also various minor bruises about both knees. Examination at that time showed some typical sprains of the muscles of the neck and of the trunk. The uterus, however, was displaced posteriorly but seemed to be normal in size, shape and consistency. The other adnexa appeared to be normal. There were bruises over both knees. The patient continued to complain of backache and in August 1939 the vaginal examination was approximately the same, that is a third degree retroversion which could not be corrected by palliative means. Could the accident have caused this retroversion? There is also a question as to whether or not a patient with a retroversion can become pregnant and if there is any scientific basis for a suggestion that spontaneous miscarriage would take place if she did become pregnant. It has been my experience that external trauma such as she sustained has no bearing whatever on the position of the female generative organs. Any information which you can give me with regard to this type of case will be appreciated.

M.D., Illinois.

ANSWER.—The question of retrodisplacement of the uterus following trauma is complicated and controversial. Spicer states that "traumatic displacements (of the uterus) may result from a fall, sudden jarring of the body, such as landing on the feet or buttocks, lifting heavy bodies, and blows over the lower abdomen." Adair says "It is also possible for a blow upon the back, or a fall upon the buttocks, to cause an acute retrodisplacement of a nonpregnant uterus, or of a pregnant uterus early in gestation. . . . It is also possible that a preexisting displacement may be aggravated by traumatic causes. . . ." Kessler states that there are two schools of thought concerning the relation between injury and uterine displacement. One flatly denies the relation and the other favors traumatic etiology in selected cases. Many authorities have apparently seen enough instances of retrodisplacement of the uterus following a severe fall to lead to the conclusion that forceful impact, such as falling on the back, may produce a bad retrodisplacement. For every such instance, however, there are many in which the patient gives a history of falling and has a retrodisplacement which is not ascribable to the injury. In almost all instances the exact relation seems difficult to prove.

Failure to conceive is rarely due to retroversion of the uterus alone. Authorities are not wholly in accord concerning the tendencies to spontaneous miscarriage in patients with retrodisplacement, but the consensus is that retrodisplacement of the uterus is a factor of some importance in the etiology of spontaneous abortion. The following references should be consulted:

- Spicer, F. W.: Trauma and Internal Disease, Philadelphia, J. D. Lippincott Company, 1939, chapter 17, p. 426.
Adair, F. L.: Trauma and Disease, edited by Leopold Brahdry and Samuel Kahn, Philadelphia, Lea & Febiger, 1937, chapter VII, pp. 224-225.
Fraser, A. J.: Trauma, Disease, Compensation: A Handbook of Their Medico-Legal Relations, Philadelphia, F. A. Davis Company, 1930, chapter IV, pp. 207-208.
Kessler, H. H.: Accidental Injuries: The Medico-Legal Aspects of Workmen's Compensation and Public Liability, Philadelphia, Lea & Febiger, 1931, chapter XIV, pp. 429-431.
Ropp, J. M.: Traumatic Displacements of the Uterus, *Virginia M. Month.* 51:101 (May) 1924.

IMMUNITY WITH TETANUS TOXOID

To the Editor:—There has been discussion from time to time here as to the advisability of using tetanus toxoid rather than tetanus antitoxin in industrial injury cases. It would be of enormous benefit to use the toxoid and immunize many of the waterfront employees, since many cases necessitating divided doses of the antitoxin due to sensitivity are seen. Would the protection against tetanus of persons immunized with toxoid and given another dose of the toxoid at the time of injury be as great as is afforded at the present time by the use of the tetanus antitoxin prophylactically?

M.D., California.

ANSWER.—In horses, tetanus toxoid produces a stable, effective and lasting immunity against tetanus. Two injections of 10 cc. each have been given at an interval of one month and a third injection of the same amount a year later. Resulting immunity has been found to last at least eight years. References are given by Gold, Harry: Active Immunization Against Tetanus, *Ann. Int. Med.* 13:768 (Nov.) 1939. The Paris correspondent of THE JOURNAL, Feb. 3, 1940, p. 424, refers to the work on horses by Ramon and Lemetayer.

Recent experiments by Gold again show that in human beings tetanus toxoid induces an active immune response, with the appearance of tetanus antitoxin in the blood. Gold injected 1 cc. of toxoid two or three times at intervals of one month. Another injection a year or so later raised the antitoxin content in the blood in four or six days to a protective level of 0.1 unit or more per cubic centimeter of serum. "One week after the 'repeat' dose, the antitoxin titer of an immunized subject is from two to fifty times greater than the titer produced by the injection of 1,500 units of tetanus antitoxin." It consequently appears to be established that in persons previously immunized with tetanus toxoid a new injection of toxoid will give better protection than the usual prophylactic injection of 1,500 antitoxin units. In occupations especially liable to traumatic tetanus, active immunization with toxoid for preventive purposes should receive serious consideration.

HEPARIN AND THROMBOSIS

To the Editor:—Have you any information as to the safety and dosage of heparin administration in the different types of thrombosis, and which heparin preparations can you recommend?

F. E. Prytek, M.D., Brooklyn.

ANSWER.—This question cannot be answered adequately in brief form. No physician should use heparin clinically until he is familiar with the literature on the subject. The highly purified material may be given by continuous intravenous infusion for days at a time. It decreases coagulation of the blood and does not do harm, apparently. To keep the clotting time of the blood at three times its normal value, Best and his co-workers employ a saline solution containing 1,000 units (10 mg.) of heparin in each hundred cubic centimeters of solution, which is allowed to run into the vein at the rate of about twenty-five drops a minute. Single intravenous injections are effective in ten minutes and decreased coagulation of the blood persists from one to three hours, depending on the amount injected. A good review article is Mason, M. F.: Heparin: A Review of Its History, Chemistry, Physiology and Clinical Applications, *Surgery* 5:451 (March), 618 (April) 1939. Other valuable articles are: Murray, G. D. W., and Best, C. H.: The Use of Heparin in Thrombosis, *Am. Surg.* 108:163 (Aug.) 1938. Murray, D. W. G., and Best, C. H.: Heparin and Thrombosis: The Present Situation, *THE JOURNAL*, Jan. 8, 1938, page 118. Round Table Discussion: Clinical Problems of Thrombosis, *Minnesota Med.* 23:1 (Jan., supp.) 1940.

QUERIES AND MINOR NOTES

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INTRADERMAL AND SCRATCH TESTS IN CHILDREN
To the Editor:—With regard to the relative value of protein tests in cases of allergy: What is the value of scratch tests with individual proteins and pollens? What is the value of scratch tests with the individual proteins combined into related groups? Does the dilution of the individual proteins necessitated by combining them into groups interfere with the response to the scratch tests in view of the difficulty of interpretation of the wheal and the erythema as a response to the temporary occlusion of the capillaries of the skin at the site of injection when the scratch gives a similar experience using the intradermal test? With a practice limited to children, intradermal tests are difficult to carry out in the office and even in the hospital if one has any sensibility to the child's reaction to pain.

ANSWER.—Cutaneous testing with combined proteins, by either the scratch or the intradermal method, is not to be recommended. It is not nearly so accurate as testing with the individual proteins. With infants and young children, routine intradermal testing is recommended. It is best to do a routine set of scratch tests first and then a few intradermal tests with some of the more important allergens to which there has been no reaction by the scratch method. There can be no doubt that the intracutaneous method is much more delicate than the scratch method, and many significant reactions will be missed if the latter is used alone. This is particularly true for milk in infants and for house dust and feathers in older children, all of which may be important in causing allergic manifestations. No intracutaneous test should ever be done on an infant or child with any environmental allergen unless it has been preceded by a negative scratch test. The same holds for any food which has never been eaten or for any food which is known to have produced violent symptoms. If a food has been regularly eaten without having produced any violent symptoms, it is safe to do an intracutaneous test before having done a scratch test.

ALCOHOLIC INTOXICATION AND CEREBRAL CONCUSSION

To the Editor:—What basis, if any, is there for a statement such as "How difficult it is to distinguish accurately between outward manifestations of concussion and of intoxication is readily apparent from the following comparison of symptoms" (Prof. Lawrence Vold, College of Law, University of Nebraska, in "Laboratory Tests for Alcoholism in Motor Accident Prosecutions," Nebraska Law Bull., vol. 17, 1938, No. 2). A long list of purported symptoms in common follows: On a previous page several authorities on brain injuries were cited, but I was unable to find any such statement in them. It is my impression that confusion could exist between punch drunkenness and intoxication, but punch drunkenness is a result of cumulative blows to the head over a period of years and not due to any single hard blow. I am familiar with the answer to a similar question in The Journal, Aug. 20, 1938, but would like a more specific reply, wherein the claim was made that he came to "punch drunk," "out on his feet" and knew nothing until he came to several hours later to find himself pacing back and forth behind the bars of a cell. The author leads up to this assertion by repeated statements as to the great similarity between concussion (it had to be simple in this case, as the accused had evidently "recovered" by the next day) and intoxication from alcohol. The result of 0.23 per cent alcohol from a laboratory test was dismissed as a "terrible error."

ANSWER.—By "cerebral concussion" is meant a state of partial or complete unconsciousness plus a widespread paralysis of cerebral function, both of which come on immediately after trauma to the head. A knockout blow delivered in a prize fight is a typical example of how concussion may be produced. In addition to the unconsciousness, which may be for a few seconds or minutes, the respirations may become shallow, the pulse weak and slow, the blood pressure low, the face pale and the extremities cold. The latter signs are dependent on the severity of the concussion; the more severe the concussion, the more frequent will these signs be. Simple cerebral concussion rarely, if ever, simulates alcoholic intoxication. There may be difficulty in a patient who has been drinking and who then develops a cerebral concussion. This occurs quite frequently. Even in such a case the differentiation should not be a problem. In simple concussion of the brain without fracture or compression there is usually some disturbance of consciousness, ranging from "seeing stars" to a temporary loss of consciousness. Severe or prolonged stupor or deep coma is not characteristic of simple injury. Here deep sleep from alcohol can be easily differentiated from a deep coma the result of a severe brain injury. In intoxication the breath has the characteristic odor, the stomach content has alcohol in it and the blood stream is positive for alcohol. In a given case of intoxication without any head injury one finds a rapid pulse (almost thready), a florid flushed face, deep respirations with warm extremities. In a recovery from intoxication

one also finds tremulous hands, a positive Quinquaund sign, tremulous speech, tremulous tongue and a varied type of mental and emotional behavior ranging from violence and garrulousness to an ordinary sleepy state. "Punch drunk" is a term used to indicate organic brain disease in a fighter who has received many punches to the head as well as knockout blows on repeated occasions usually requiring weeks, months or years to develop.

COOKING PORK TO DESTROY TRICHINELLA

To the Editor:—I have read with great interest the article on trichinosis in the January 6 issue of The Journal. The article is thorough and satisfactory in every respect except in the matter of prevention. Mention is made of definite processing conditions for pork and pork products prescribed by the Bureau of Animal Industry of the United States Department of Agriculture. And then the statement is made that foods not so prepared should be thoroughly cooked. What is thorough cooking? For instance, how long should bacon be fried? How long should sausages be kept on the grill? How long should fried ham steak be on the fire? How long should pork chops be cooked? What temperature destroys Trichinella larvae? Would preliminary boiling in water destroy Trichinella larvae? If so, how long should the meat be boiled? It is really important to know these points because there has been considerable newspaper publicity about trichinosis and many people are asking these questions.

ANSWER.—Trichinella larvae are destroyed at a minimum temperature of 137 F., but it is apparent that every part of the cut being cooked must reach this minimum temperature. Perfectly safe procedure for the preparation of pork or products containing pork is to cook until well done. In the case of fresh pork, a good criterion is the disappearance of the pink color from the center of the piece of meat. In prepared pork such as bacon, the color is fixed so it will remain pink after cooking but the difference between rare and well done is so obvious that it can be recognized with assurance. Pork products cooked to the stage of well done will have reached a temperature of at least 170 F., which is a safety margin of 33 degrees F. over the 137 F. necessary to kill Trichinella larvae. It is impossible to answer this question in terms of the length of time that bacon should be fried, sausage kept on the grill, fried ham steaks on the fire or pork chops cooked, because the time of cooking is affected by the size of the cut, the nature of the container and the intensity of the flame used in cooking the meat.

Preliminary boiling in water to an inside temperature of 137 F. would destroy Trichinella larvae, but this particular method of applying adequate heat has no special virtue over other methods. Since it would affect the palatability of the product, it is not recommended. Pork cuts and pork preparations should be cooked by the methods which custom has established as producing the most palatable product and cooked for a sufficient length of time under conditions so that there is no trace of pink in the most central point.

SENSITIVITY TO TOBACCO SMOKE

To the Editor:—A patient complains of an almost continuous postnasal discharge and rhinitis. He has been examined by a competent nose and throat specialist, and a diagnosis of local sensitivity to tobacco has been made. The patient has complete relief from the rhinitis and pharyngeal drip almost immediately on stopping smoking. In addition he complains of occasional headache, chest pains, cough and dyspnea, all of which symptoms disappear on cessation of smoking. He has tried, on the advice of a physician, to smoke a "denicotinized" cigarette, and although he has tried several such brands he has had no relief. Is this a form of allergy to tobacco or some other constituent of the cigarette? If so, can the patient be properly desensitized? The patient is anxious to continue smoking, if he can be spared the aforementioned symptoms. Do you have any recommendations with regard to a specific remedy or mode of therapy to correct this sensitivity?

ANSWER.—Tobacco may cause symptoms of the upper respiratory passage in two ways: (1) as a nonspecific irritant with action similar to that of other fumes, e. g. gasoline, steam and smoke, and (2) as a specific allergen in an individual who is allergic.

As it is the tobacco leaf itself to which sensitivity is exhibited rather than the active drug nicotine, obviously "denicotinized" cigarettes would be of no help as the tobacco leaf is still present. Sometimes another brand of cigarettes which may contain other volatile substances can be smoked without difficulty. Desensitization to tobacco by injections has not been found satisfactory. Avoidance of smoking is much better and is to be recommended.

Only about 1 per cent of patients suffering from asthma and perennial vasomotor rhinitis exhibit positive cutaneous tests to tobacco and clinically allergy to tobacco is rare. A large number of these patients, however, are irritated by tobacco smoke. Handlers of tobacco in factories may acquire a contact dermatitis.

Council on Medical Education and Hospitals

ADDITIONAL HOSPITALS APPROVED

The Council on Medical Education and Hospitals of the American Medical Association has given its approval to the following hospitals since the publication of the last previous list in THE JOURNAL, January 6:

Approved for Intern Training

Lewis-Gale Hospital, Roanoke, Va.

Residencies and Fellowships

Anesthesiology

University Hospitals, Iowa City.

Communicable Diseases

Philadelphia Hospital for Contagious Diseases, Philadelphia.

Malignant Diseases

New England Deaconess Hospital (Palmer Memorial Unit), Boston.

Mixed

La Fayette Home Hospital, La Fayette, Ind.

St. Elizabeth Hospital, La Fayette, Ind.

Lutheran Deaconess Home and Hospital, Minneapolis.

Grace Hospital, Richmond, Va.

Neurology

Welfare Hospital for Chronic Diseases, New York City.

Ophthalmology

Welfare Hospital for Chronic Diseases, New York City.

Pediatrics

Lincoln Hospital, New York City.

Bradford Memorial Hospital for Babies, Dallas, Texas.

Surgery

Lenox Hill Hospital, New York City.

Thoracic Surgery

University of Oregon Medical School Hospitals and Clinics, Portland.

Tuberculosis

Los Angeles Sanatorium, Duarte, Calif.

Bret Harte Sanatorium, Murphys, Calif.

San Diego County General Hospital, San Diego, Calif.

Sunnyside Sanatorium, Indianapolis.

Norfolk County Hospital, South Braintree, Mass.

Ingham Sanatorium, Lansing, Mich.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, March 2, page 823.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part II, May 1-2; Part III, June or July, to be given in medical centers having five or more candidates desiring to take the examination. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Oral. Part II, New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. If a sufficient number of applications were received before March 1 an examination will be held at New York, June 10-14. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Oral. Following the meeting of the American College of Physicians and in advance of the meeting of the American Medical Association. Applications must be on file six weeks in advance. Written. October 21. Applications must be on file by September 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathologic examinations (Part II) for all candidates (Groups A and B) will be conducted in Atlantic City, N. J., June 7-10. Applications for admission to Group A, Part II, examinations must be on file not later than March 15. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Oral. New York, June 8-10; Cleveland, Oct. 5. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Chicago, June 15-16. Applications must be on file on or before April 15. Sec., Dr. Fremont A. Chandler, 6 North Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Memphis, Tenn., Nov. 17, preceding the annual meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Cincinnati, May 17-18. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: New York, June 7-10. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., Rochester, Minn.

AMERICAN BOARD OF SURGERY: Various centers, April 1. Sec., Dr. J. Stewart Rodman, 225 South Fifteenth St., Philadelphia.

Wyoming October Examination

Dr. M. C. Keith, secretary, Wyoming State Board of Medical Examiners, reports the written examination held at Cheyenne, Oct. 2, 1939. The examination covered thirteen subjects and included seventy-eight questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. Six physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Creighton University School of Medicine.....	(1938)	85	
University of Wisconsin Medical School.....	(1938)	83.2	

School	LICENSED BY ENDORSEMENT	Year Grad.	Per Cent
College of Medical Evangelists.....	(1938)	N. B. M. Ex.	
University of Colorado School of Medicine.....	(1937)	Colorado	
University of Kansas School of Medicine.....	(1937)	Kansas	
Tulane University of Louisiana School of Medicine.....	(1938)	Louisiana	
University of Nebraska College of Medicine.....	(1934)	Nebraska	
Jefferson Medical College.....	(1924)	Utah	
Osteopath *		Nebraska	

* Licensed to practice osteopathy and surgery.

Connecticut November Examinations

Dr. T. P. Murdock, secretary, Connecticut Medical Examining Board, reports the written examination held at Hartford, Nov. 14-15, 1939. The examination covered nine subjects and included seventy questions. An average of 75 per cent was required to pass. Forty-six candidates were examined, seventeen of whom passed and twenty-nine failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine.....	(1937) 77.6,†	(1938)	75
Loyola University School of Medicine.....	(1939)	75	
Harvard Medical School.....	(1938)	79.9	
Tufts College Medical School.....	(1938) 75,†	77.9, 81	
New York University College of Medicine.....	(1937) 79.4,†	84.7†	
University of Rochester School of Medicine.....	(1936)	77.5,	
(1937) 78.4,† (1939) 79.6			
Jefferson Medical College of Philadelphia.....	(1939)	76.9	
McGill University. Faculty of Medicine.....	(1939)	75†	
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1920)	75	
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau	(1921)	75	
Université de Genève Faculté de Médecine.....	(1938)	75†	

School	FAILED	Year Grad.	Per Cent
University of Illinois College of Medicine.....	(1937)	66.6	
Temple University School of Medicine.....	(1931)	64.9	
University of Vermont College of Medicine.....	(1938)	71.4	
Medizinische Fakultät der	(1923)	60.5,	
(1927) 71.7, 71.9, (1934) 5.2			
Deutsche Universität Medizinische Fakultät, Prag.....	(1936)	72.1	
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1927)	73.7	
Albertus-Universität Medizinische Fakultät, Königsberg	(1924)	68.3	
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen	(1934)	60.6	
Georg-August-Universität Medizinische Fakultät, Göttingen	(1927) 65.2, (1937)	62.7	
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt am Main	(1938)	70	
.. .. Medizinische Fakultät,	(1925)	62.9	
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau	(1927)	69.5	
Universität	(1920)	67.8	
Universität	(1923)	67.5	
Vereinigten	(1930)	65.4	
Halle-Wittenberg	(1937)	65.7	
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs	(1937)	65.7	
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest	(1937)	63.5	
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia	(1937) 71.6, (1938)	63.8	
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1936) 66.2, (1937)	69	
Université de Genève Faculté de Médecine.....	(1934)	65.8	
Osteopath *			

Twenty-seven physicians were successful in the oral examination held for endorsement applicants at Hartford, November 28. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Per Cent
Yale University School of Medicine.....	(1931)	California.	
(1935), (1936), (1937),† (1937), (1938, 2) N. B. M. Ex.			
George Washington University School of Medicine.....	(1927)†	New York	
Georgetown University School of Medicine.....	(1936) N. B. M. Ex.		
Indiana University School of Medicine.....	(1928)†	Indiana	
Tulane University of Louisiana School of Medicine.....	(1931)†	New York	
Johns Hopkins	(1931)	Ex., (1936)† Maryland	
Harvard Medical College	(1938)†	N. B. M. Ex.	
Tufts College			
Columbia University	(1934), (1936)	New York	

Cornell University Medical College.....(1936),† (1938)† N.B.M.Ex.
Fordham University School of Medicine.....(1915)† New York
New York University College of Medicine.....(1932) New York
University of Pennsylvania School of Medicine.....(1936) Michigan
Vanderbilt University School of Medicine.....(1936) Tennessee
University of Texas School of Medicine.....(1927)† New York
University College of Medicine, Richmond.....(1911)† Virginia
McGill University Faculty of Medicine.....(1935) New York

* Examined in medicine.

† License has not been issued.

Book Notices

Epidemiology in Country Practice. By William Norman Pickles, M.D., Medical Officer of Health, Aysgarth Rural District, Yorkshire. With preface by Major Greenwood, F.R.S., D.Sc., F.R.C.P., Professor of Epidemiology and Vital Statistics in the University of London. Cloth. Price, \$2.50. Pp. 110, with illustrations. Baltimore: William Wood & Company, 1939.

This well written book should be read by the practicing physician residing in rural or urban areas. The obvious desire to find the clinical and epidemiologic answer to the illnesses coming under the scrutiny of the careful and thoughtful physician should prove an inspiration to the reader. This striking paragraph of the introduction deserves full quotation:

The general practitioner is in the forefront of the battle and his experience must necessarily be personal and vital. No consulting physician can ever have the opportunity to follow the whole course of such a disease as epidemic myalgia in the same way as the general practitioner, because of the latter's more intimate association with his patients.

Modern public procedure certainly endorse these sentiments.

The second quotation, taken from page 5, middle paragraph, is all inclusive and exceedingly valuable advice:

The object of this book is primarily an attempt to stimulate other country doctors to keep records of epidemic disease and to put before them the unique advantages that their position gives them, to impress on those interested in epidemiology the value of the natural history method of investigation of these diseases, and to awaken some interest in the layman, whose help in these matters cannot be overestimated.

Of particular interest to health officers are the author's observations on the school teacher as an epidemiologist (p. 6), the reference to the school epidemic investigation of the Medical Research Council (p. 8), the sound advice to the young physician entering country practice to regard as a hobby if not otherwise the natural history of epidemic diseases (p. 9) and the comments of the often vexed question of school closure (p. 22). The chapter on epidemic catarrhal jaundice is alone worth the price of the book. Altogether this book is a welcome addition to the volumes in the field of medicine and public health, and it offers an example to the practicing physician in the manner cases of communicable diseases should be studied for informative data and reported to health departments for adoption of accepted or known methods of control.

The Electrocardiogram and X-Ray Configuration of the Heart. By Arthur M. Master, B.S., M.D., F.A.C.P., Associate in Medicine and Chief, Cardiographic Laboratory, The Mount Sinai Hospital, New York. Cloth. Price, \$6.50. Pp. 222, with 100 illustrations. Philadelphia: Lea & Febiger, 1939.

This monograph sets out to demonstrate that the electrocardiographic appearance is determined to a large extent by the contour, size and position of the heart in the chest. The author clearly demonstrates that considerable variations in the electrocardiogram can be caused in these ways and that the effect of these other factors must be excluded before the interpretation is made that an underlying myocardial disease exists. The monograph will be illuminating to those few cardiologists who tend to read into the electrocardiogram evidences of myocardial disease when they are not present. The subject matter has recently received new impetus and is becoming more and more widely recognized and, as the author states, the type of body structure, the position of the patient and the location of the heart in the chest must all be considered in arriving at an interpretation of a particular record. The development of each topic is begun with a historical survey and is followed by case presentations, each with illustrations of the electrocardiograms and teleroentgenograms; the reproduction of these is excellent and the details of the x-ray plates are clearly discernible. The presentation, however, is disconnected; the facts are not sufficiently summarized, as could have been done by expanding the text and

adding short summaries to each section. The descriptions of the electrocardiograms are not consistent, and a number of obvious errors are apparent. For example, in figure 25 the author speaks of a large Q wave in lead 3, which is not apparent in the record. Similar errors in the text give the impression of superficiality on the part of the author which is regrettable. The subject matter includes a consideration of the effects on the electrocardiogram of age, of change in body position, of respiration, of body habitus, of hypertension, of valvular disease, of congenital heart disease, of pulmonary disease, of chest deformities, of pericarditis and of hyperthyroidism. This monograph is not suitable for the beginner in electrocardiography and is obvious to one of large experience. It is useful for the electrocardiographer of experience who has developed the habit of reading into the record more abnormalities than actually exist in the electrocardiogram.

In memoria del Prof. Fabio Rivalta: La "reazione di Rivalta," scritti model in suo onore. Società medico chirurgica di Romagna. Paper. Price, 50 lire. Pp. 398, with illustrations. Faenza: Fratelli Lega, 1939.

The memorial volume published by the Medico-Chirurgical Society of Romagna in honor of Prof. Fabio Rivalta contains some excellent monographs by leading physicians and surgeons of Romagna and other parts of Italy who have either been associated with Rivalta personally or who are now at the head of medical clinics in hospitals where Rivalta served as physician-in-chief. The subjects range from lipoid nephrosis to undulant fever and to monographs on the last disease and death of the composer Bellini. There is also an excellent monograph on the use of insulin, modified by bicarbonate treatment.

The first reaction, introduced nearly forty-three years ago, affords a simple and reliable method of differentiating between transudates and exudates. This reaction is well known and described in almost all the textbooks on clinical and laboratory methods. Wells's "Chemical Pathology" and Kolmer's "Approved Laboratory Technique" give detailed description of the method. The second reaction, which Rivalta announced in the *Policlinico* in 1910, is almost unknown to the English speaking world. The first reaction can be easily performed by any laboratory technician. About 200 cc. of distilled water is placed in a conical beaker, and three drops of glacial acetic acid are added. After thorough mixing one or two drops of the fluid under examination are placed in this weak acid solution. A distinct cloud will be observed in the fluid if the material is an exudate, whereas the reaction will be negative if the fluid is a transudate. Professor Rivalta proved that this phenomenon is due to the presence in an exudate of large amounts of globulin, which is absent in transudates.

The second reaction has been introduced to give physicians a simple method of determining in serum and blood an index of antibody production, in both acute and chronic infectious processes. It is performed by placing in a conical beaker 200 cc. of distilled water and placing therein three drops of glacial acetic acid. In other containers the technician makes serial dilutions of blood serum and of whole blood from 1:200 to 1:2,000 in a weak alkaline solution of distilled water (distilled water 100 cc., sodium carbonate saturated solution one drop). By performing the reaction with varying dilutions of the patient's serum ranging from 1:200 to 1:2,000 one can get an approximate quantitative idea of the antibody production taking place.

The hemoreaction and the seroreaction of Rivalta seem to have been studied on a large number of patients in many chronic and acute infectious processes. From the monographs contained in this volume by Chiadini it seems that these reactions are growing in popularity. Both reactions are simple and any laboratory technician can perform the test in a few minutes. It is noteworthy that a close parallelism has been found between the quantitative reactions and the leukocytosis. Gironi presents also an important monograph showing that the reaction appears to be indicative of the amounts of antitoxin present in the serum. He has immunized animals with ricin and found that with the production of antiricin the reaction becomes positive in higher and higher dilutions as the titer of antiricin increases. As the antibody titer begins to go down the reaction also continues positive only in the lower dilutions. It is to be hoped that clinical pathologists and biochemists will be attracted to these

simple methods of obtaining a glimpse of the immunity reaction going on in the animal and in the patient. This method may supply to the clinician a prognostic sign of the highest value and from the monographs reviewed it appears that many great clinicians in Italy have actually found the seroreaction of unquestionable merit in prognosis.

To the chemist and biochemist, working in laboratories, devoted to the production of antitoxins and antisera, this reaction supplies a reliable and inexpensive method of determining the potency and also knowing when the animal under immunization has reached the highest level of antibody production and then proceed from this point to subject the serum to the quantitative methods of potency assay expressed in units per cubic centimeter. This would eliminate the necessity of costly and time consuming assays during the process of immunization and would afford a simple inexpensive means of knowing, at intervals, in the process of immunization, how well the antitoxin production was going on in the animal.

Blood Groups and Blood Transfusion. By Alexander S. Wiener, A.B., M.D., Serologist and Bacteriologist in the Office of the Chief Medical Examiner of New York City. Second edition. Cloth. Price, \$5. Pp. 306, with 52 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

This edition has been revised to include the advances in the knowledge and practice of blood grouping since the issue of the book in 1935. Transfusion and the medicolegal uses of blood group tests have received special consideration. The main topics of the contents are the four blood groups and their use in the selection of donors in transfusion, in anthropologic studies, in cases of disputed parentage and in the identification of stains. There are chapters also on the heredity and constitutional nature of blood groups; on agglutinogens M and N, their heredity; on subgroups A and AB; on individual differences in animal blood, and on blood groups in relation to disease. Blood transfusion is discussed with respect to history, selection of donors, technic, indications and results. The book is a standard work in its field, which it covers competently and comprehensively. It will be of interest and value not only to those concerned with blood transfusion and with problems of parentage and identification but also to the immunologist, the geneticist and the anthropologist.

Die Gonorrhöe der Frau: Ein Leitfaden für die Praxis. Von Dr. Karlheinz Sommer, Marlinestabsarzt z. Zt. Komm. an die Universitäts-Frauenklinik Leipzig. Paper. Price, 8.50 marks. Pp. 185, with 47 illustrations. Leipzig: Georg Thieme, 1939.

This monograph is well done and is nicely illustrated with both gross and microscopic plates. The subject is approached with an underlying study of the anatomy and physiology of the female generative tract. The subject of gonorrhea is taken up from the bacteriologic point of view before the discussion of the effects of the disease on the female. The disease in women is studied from the result on the lower and then on the upper tracts. Treatment is adequately covered, with mention being given to all used forms of treatment. Gonorrhea in pregnancy and the remote complications of the disease are also covered. For one who is especially interested in the subject this little book should be of great value.

Etudes neurologiques. Huitième série. Par Georges Guillaumin, professeur de clinique des maladies du système nerveux à la Faculté de médecine de Paris. Table générale des matières des "Etudes neurologiques" (séries I à VIII). Paper. Price, 90 francs. Pp. 419, with 72 illustrations. Paris: Masson & Cie, 1939.

Guillaumin, the author of the present collection of reprints, is a successor of Charcot, Dejerine and Marie as professor of neurology in the Faculty of Medicine in the University of Paris and neurologic director of the Salpêtrière. The present volume is the eighth of a series, all planned on the same principle, each containing a collection of reprints by Guillaumin which have been published elsewhere with a few exceptions. This book concludes with an index to all the eight volumes which have appeared. The present volume is made in five parts. The first part contains five articles dealing with the pathology of the brain. The second part contains five articles on the peduncles, mouth and cerebellum. The third part contains only three articles on the spinal cord. The fourth deals with pathology of the cranial and spinal nerves, and in it five subjects are discussed. The last section is the largest, having ten varied reprints dealing with

such subjects as the clinical and biologic study of the care of acromegaly, a discussion of a case of milkman's syndrome and a study of the labyrinth in Paget's disease. All these papers are excellent and represent the best of French neurology. They are composed either of one thorough case history with the pathologic changes observed or they present topics which are illustrated by a number of case histories. One of the papers is in English and carries with it a French translation. This paper is on radiculoneuritis with acellular hyperalbuminosis of the cerebrospinal fluid, which appeared in the *Archives of Neurology and Psychiatry* in November 1936. For those physicians who read French and who wish to be acquainted with a good sample of French neurology, this collection of reprints would be of great value. In fact, one can urge on the neurologist a thorough acquaintance with all the eight volumes of reprints in this series by Guillaumin.

Lehrbuch der allgemeinen Pathologie und der pathologischen Anatomie. Von H. Ribbert. Bearbeitet von Professor Dr. H. Hamperl, Prosektor am Pathologischen Institut der Universität Berlin (Charité-Krankenhaus). Twelfth edition. Paper. Price, 27 marks. Pp. 634, with 700 illustrations. Berlin: F. C. W. Vogel, 1939.

For this hurried and harried generation of medical students the name of Ribbert can have little significance; indeed, a possible suggestion of antiquity implied in a twelfth edition would presumably deter rather than recommend perusal. But survival does at times indicate usefulness, and this new Ribbert, revised by Hamperl, is definitely a useful book. One might designate it a streamlined edition, if such a descriptive term is permissible in connection with so orthodox and orderly a subject as general pathology has become in the decades that have followed the exciting era of Virchow. The editions of Ribbert which were edited by Mönckeberg and later by Sternberg more than maintained the earlier traditions. The present text, while adhering to the original, has greatly amplified and broadened the point of view, so that it is quite abreast of modern trends and much has been added in illustrative material, which is in the main excellent in character and selection. Hamperl is primarily the morbid anatomist trained in the Viennese school; it is natural that it is form, rather than form plus function, that colors the book, but it would probably be asking too much in a textbook of pathology to reflect changes in clinical thought that are far in advance of the postmortem room and the histopathologic laboratory. Virchow himself was primarily the physiologist who taught pathologic anatomy, but with the course of time and the crystallization of departmental teaching the morbid anatomist can hardly be expected to teach pathology and to write textbooks that would treat of function rather than form. Of all modern textbooks one finds a consistent effort to do just that only in Tendeloo, and this book has never been popular in either continental or American schools. All of which by no means detracts from the recognition of the excellent quality of the new edition, which presents general as well as special pathology in a well illustrated, well balanced and orderly fashion. Attributes such as these have made the Ribbert an exemplary student textbook for several generations. But this, as a natural corollary, must exclude features which might make the book more useful for the clinician and the investigator. An interesting innovation is found in footnotes that give both Greek and Latin derivation of descriptive terms—in itself an interesting sidelight into the modern German educational system. In Ribbert's day a thorough grounding in the classics was still obligatory.

Gynecology: Medical and Surgical. By P. Brooke Bland, M.D., F.A.C.S., Consulting Obstetrician to the Jefferson Medical College Hospital, Philadelphia. Assisted by Arthur First, M.D., Associate in Obstetrics, the Jefferson Medical College Hospital, Philadelphia. Third edition. Cloth. Price, \$8. Pp. 843, with 445 illustrations. Philadelphia: F. A. Davis Company, 1939.

According to the preface, the author has practiced gynecology for more than thirty-five years. His book describes the sound principles and conservative methods resulting from this long experience. It is a good textbook, well proportioned, full and accurate, but it has two obvious weaknesses. The first is prolixity. At present a crisp factual style is preferred; the third edition has been rewritten but it is filled with the slow phraseology of the first (1924). The second weakness is the paucity of fact. Advantage has not been taken of the abundant literature

of gynecologic statistics. For example, gynecologists agree that approximately 25 per cent of patients with carcinoma of the cervix in a well treated series will survive five years or more after treatment. On this subject the author says "The duration of life . . . is longer in body than in cervical carcinoma." Nowadays such vagueness is unsatisfying. Facts are available; let us have them! The reader will find the literature nicely tabulated in a separate chapter of twenty-seven pages on referred reading. Illustrations are good and the color plates of normal and pathologic organs are superb. This volume will be more useful to undergraduates than to practitioners.

Psycho-Dynamics of Chewing. By H. L. Hollingworth. *Archives of Psychology*, No. 239. Paper. Price, \$1.50. Pp. 90. New York: Columbia University, 1939.

By what appear to be adequate experiments on twenty human subjects, the author endeavors to explain the role of sustained mastication in the psychophysical economy of human activity. This mastication is not that of chewing a meal but chewing on gum or on indifferent substances when at rest or when busy with other mental or physical work. The several lines of experiments indicate clearly that such chewing results in a decrease of neuromuscular tension and most of the subjects reported that they actually felt more relaxed as a result of the chewing. The slight physical cost of the chewing process itself may thus result in economy by muscular relaxation in the rest of the body. The author suggests that this relation between sustained chewing and relaxation is a carry over from the fact that, in civilized man at least, the mastication in connection with eating is usually accompanied by sitting down and otherwise relaxing. This is an interesting and possibly significant study. One stenographer showed increased speed in typing while chewing. Another showed increased speed but decreased accuracy. In the main this work indicates that there may be more physiologic significance to the gum chewing habit of Americans than would appear on the surface.

A Survey of Hospital Services and Finances in the Philadelphia Area Based on Data Collected from 67 Philadelphia Hospitals for the Year 1937. Sponsored by the Hospital Council of Philadelphia. Paper. Price, \$1. Pp. 59. Philadelphia, 1939.

This report on the survey of hospital services and finances in the Philadelphia area is best summed up in its own statement of conclusions and recommendations, in which it is stated that the purpose is to describe the amounts and types of services rendered and that it was not intended to establish categorical conclusions or to set up a qualitative scale for measuring hospital service. It is stated, nevertheless, that the task of gathering the data would hardly be justified without some suggestions, and with this in mind the author makes fifteen suggestions looking toward the improvement of hospital service in the Philadelphia area. These conclusions and recommendations might apply to other areas as well. In fact, the whole report furnishes profitable reading for those interested in hospital service for any given community.

Obstetrícia normal. Pelo Professor Raul Briquet, lente catedrático de Clínica obstétrica e puericultura neo-natal da Universidade de S. Paulo. Cloth. Pp. 538, with 427 illustrations. Rio de Janeiro: Livraria Editora Freitas Bastos, 1939.

This volume on normal obstetrics represents an outline of present day obstetric thought and teaching. Its content is limited to the problems of normal midwifery, so that this book should meet a real need in South American countries, for which it was probably written. The general practitioner will find a wholesome presentation. The book opens with a chapter on the medical historical background of pregnancy and labor and ends with a chapter dealing with the newborn. The physiology and conduct of pregnancy and labor are described and profusely illustrated. There is a long chapter on multiple births and the problems which these entail. The book could be improved by a more detailed description of some of the major complications of pregnancy, such as infection, toxemia and hemorrhage, for these cannot be divorced from normal obstetrics. Many illustrations have been taken from Bumm's textbook and De Lee's *Principles and Practice of Obstetrics*. The quality of the illustrations, the paper and the binding could be greatly improved on.

Physiology in Health and Disease. By Carl J. Wiggers, M.D., Professor of Physiology in the School of Medicine of Western Reserve University, Cleveland, Ohio. Third edition. Cloth. Price, \$9.50. Pp. 1,144, with 218 illustrations. Philadelphia: Lea & Febiger, 1939.

The present edition is a great improvement over the first. A number of new illustrations have been added. The entire section on muscle has been rewritten and rearranged, as has also the second section on neurophysiology, so that both read much more smoothly. Despite the inclusion of new material, the total number of pages is slightly less than in the first edition but considerably greater than in the second edition. Despite the general improvement in composition, the subject matter appears to be still rather unbalanced. The number of pages in the section on neurophysiology has been increased, but in most of the other sections except the one on circulation the number has been reduced. This may perhaps be justifiable in most instances but certainly gastrointestinal physiology and metabolism deserve more balanced treatment in comparison to circulation. The illustrations are excellent. The author has maintained the policy of putting references in footnotes on the pages where used. This facilitates to some extent the checking of references by readers. Instances of unusual and even incorrect word usage are rather more frequent than one expects in a scientific work of this caliber, e. g. "exorbitant" for "excessive" (p. 980). However, the subject matter is sound.

The British Encyclopaedia of Medical Practice including Medicine, Surgery, Obstetrics, Gynaecology and Other Special Subjects. Under the General Editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D. Volume XII: Tetanus to Yellow Fever. Cloth. Price, \$12. Pp. 672, with 48 illustrations. Toronto & London: Butterworth & Co., Ltd., 1939.

The latest volume of this notable series carries all of the conditions from "tetanus" through "yellow fever." This means, of course, such important subjects as the thymus, tonsils, toxicology, trachoma, tuberculosis, tumors, urine, uterus, vertigo, vitamins and whooping cough. Such distinguished names as those of Kenneth Walker, Manson Bahr, McCallan and Sir Leonard Rogers are an indication of the high quality of material that this volume provides. It is quite up to the previous volumes in this excellent series.

Therapeutisches Taschenbuch der wichtigsten Krankheiten der warmen Länder: Ein kurzer Ratgeber. Von Prof. Dr. P. Mühlens, Direktor des Instituts für Schiffs- und Tropenkrankheiten, Hamburg. Boards. Price, 2 marks. Pp. 73, with 16 illustrations. Leipzig: Georg Thieme, 1939.

This pocket handbook discusses the main clinical features, prevention and treatment of the principal tropical diseases. Discussions are so brief and sketchy that one can scarcely credit its intended use for the medical profession. It is an example of oversimplification.

Clinical Diagnosis by Laboratory Methods: A Working Manual of Clinical Pathology. By James Campbell Todd, Ph.D., M.D., and Arthur Hawley Sanford, A.M., M.D., Professor of Clinical Pathology, University of Minnesota (The Mayo Foundation), Rochester. Ninth edition. Cloth. Price, \$6. Pp. 841, with 368 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

The revision of this book brings it abreast of the time, as far as this can be done with a standard textbook. Most notable additions are the new section on hematopoiesis and the methods for the Bodansky determination of phosphate and phosphatase, the Power and Wakefield sulfate method, the hippuric acid test and serum lipase, ascorbic acid and sulfanilamide determinations. As it has always been, this book is a fine textbook for laboratory technicians and should be included in every laboratory no matter how small that laboratory may be.

Die Gonorrhöe in der Allgemeinpraxis. Von Professor Dr. Paul Mulzer, Direktor der Universitäts-Klinik für Haut- und Geschlechtskrankheiten in Hamburg. Paper. Price, 8.40 marks. Pp. 125, with 10 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

This small volume covers gonorrhea in both the male and the female. The subject is taken up from the bacteriologic and clinical points of view and is well handled. Although meager in illustrations, the text is fairly complete. Particularly interesting is the section on treatment, in which heat and specific chemotherapy with sulfanilamide are discussed. In the section on infantile vulvovaginitis, mention is not made of estrogenic therapy.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Accident Insurance: Death Following Administration of Nearsphenamine.—The defendant insurance company promised to pay to the beneficiary certain benefits if the death of the insured resulted from bodily injury effected solely through external, violent and accidental cause and not from physical or mental infirmity or illness or disease of any kind. The insured had syphilis and was receiving medical treatment consisting of alternate hypodermic injections of bismuth and nearsphenamine. Following the fifth administration of the arsenical, administered about a month after the first, the insured suffered a violent reaction and died. The insurer refused to pay the beneficiary, the beneficiary sued, the trial court directed a verdict for the insurer and the beneficiary appealed to the supreme court of New York, appellate division, first department.

The quantity of nearsphenamine injected had commenced with 0.3 Gm. and was gradually increased to 0.6 Gm. and had been administered in the customary manner and without untoward incident. The physicians called as witnesses for the beneficiary testified that unfavorable reactions to injections of nearsphenamine occur very rarely, that the average risk of death is about one in 7,000 to 11,000 instances but that an unfavorable reaction to the drug is always a possibility. They stated that medical science has no way of anticipating which patient will be hypersensitive to the drug. These witnesses testified, too, that the existence of a syphilitic condition in the insured in no way contributed to his death, although it was because of the presence of that disease that the drug was administered. In their opinion the death resulted directly and solely because of the treatment being received by the insured.

To the court, it was clear that the death resulted from an accident within the meaning of the insurance policy. It has been held, the court pointed out, that if a fatal infection results from the use of a hypodermic needle the case is one of accidental death within the meaning of a similar insurance policy. The fact that the insured intentionally incurred the administration of the drug did not preclude a finding that death occurred through accidental means. In the present case, the hypodermic needle did not introduce a germ or other foreign substance which caused infection; it merely introduced the drug sought to be injected. Death, however, occurred from the extremely rare circumstance that the insured had some physical peculiarity that made him hypersensitive to the nearsphenamine. The predisposition to unfavorable results from nearsphenamine did not constitute an infirmity or disease within the meaning of the policy.

The judgment of the trial court was reversed and a new trial ordered.—*Berkowitz v. New York Life Ins. Co. (N. Y.)*, 10 N. Y. S. (2d) 106.

Optometry: Obtaining Money Under False Pretenses.—For a period of four years the accused drove a car for an optometrist and acted as a "flunky" for him, carrying his instrument case and generally helping him in his work. During these years the optometrist traveled extensively through southern Missouri. After the traveling optometrist quit that territory, the accused formed an association with one King, and the two went about examining eyes and prescribing glasses. During the course of their "practice" they examined the eyes of the Cooper family, consisting of the husband, the wife and a child. This family was induced to buy three pairs of spectacles for which the husband gave to the accused checks in the amount of \$59.94. The spectacles were to be delivered within a few days but were in fact never delivered. The checks were cashed by the accused and thereafter he was convicted on a charge of obtaining money under false pretenses and appealed to the Supreme Court of Missouri.

Neither King nor the accused had licenses to practice medicine or optometry. The state introduced substantial evidence tending to prove that the accused stated to a number of persons that he was a physician and had been practicing medicine in

Springfield; that "Dr. King" had treated eyes and fitted glasses for many of his, the accused's patients, and had always given satisfaction; that he, the accused, and King had rented rooms at West Plains and were going to locate there and that if the glasses they sold were not satisfactory they would make adjustments. One witness and his wife testifying for the state said that they had bought spectacles from the accused and King and had paid them. The receipt given for this payment was signed by the accused as "Dr. B. H. Craft, 456 Market Street, Springfield, Missouri." Mrs. Cooper testified that when King was "pretentiously" examining her eyes he looked up at the accused and said "Doctor, haven't I treated lots of your patients and always given satisfaction in fitting glasses?" and that the accused replied "You sure have." The accused contended that he acted merely as a "flunky" for King, as he had done for the optometrist, and that King pretended to be an eye specialist but that he later found that "the highest ranking King ever obtained was that of a prizefighter." The court, however, was apparently not impressed with the contentions of the accused and after examining the entire record found it free from error. The judgment of conviction was therefore affirmed.—*State v. Craft (Mo.)*, 126 S. W. (2d) 177.

Society Proceedings

COMING MEETINGS

- Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
- Alabama, Medical Association of the State of, Birmingham, Apr. 16-18. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for the Study of Neoplastic Diseases, Louisville, Ky., Apr. 11-13. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- American Association of Anatomists, Louisville, Ky., Mar. 20-22. Dr. E. R. Clark, Dept. of Anatomy, Univ. of Pennsylvania School of Medicine, Philadelphia, Secretary.
- American Association of Pathologists and Bacteriologists, Pittsburgh, Mar. 21-22. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.
- American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.
- American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.
- American Orthopedic Association, Kansas City, Mo., May 4-10. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.
- American Physiological Society, New Orleans, March 13-16. Dr. Philip Bard, Johns Hopkins Medical School, Baltimore, Secretary.
- American Society for Experimental Pathology, New Orleans, March 13-16. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.
- American Society for Pharmacology and Experimental Therapeutics, New Orleans, March 13-16. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.
- American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
- American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixer, 319 Longwood Ave., Boston, Secretary.
- Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie R. Kober, 15 East Monroe St., Phoenix, Secretary.
- Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
- Federation of American Societies for Experimental Biology, New Orleans, Mar. 13-16. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.
- Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
- Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
- Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-24. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.
- Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. B. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
- Missouri State Medical Association, Joplin, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 634 North Grand Blvd., St. Louis, Executive Secretary.
- Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. R. B. Adams, 416 Federal Securities Building, Lincoln, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 9. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glenn Bell, University of California Hospital, San Francisco, Secretary.
- Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Southeastern Surgical Congress, Birmingham, Ala., Mar. 11-13. Dr. Benjamin T. Beasley, 701 Hurt Building, Atlanta, Ga., Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

Current Medical Literature

AMERICAN

The Association Library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, New York

96: 517-770 (Nov.) 1939. Partial Index

- Significance of Special Mental Tests for Diagnosis and Prognosis in Schizophrenia. K. Goldstein, New York.—p. 575.
- *Use of Metrazol in Treatment of Acute Alcoholism. L. L. Orenstein, K. M. Bowman, Julia R. Kagan and W. Goldfarb, New York.—p. 589.
- *Psychoses Associated with Epilepsy. R. A. Clark and J. M. Lesko, Boston.—p. 595.
- Sensitivity. E. Kahn and Helen G. Richter, New Haven, Conn.—p. 609.
- Attitude of Neurologists, Psychiatrists and Psychologists Toward Psychoanalysis. A. Myerson, Boston.—p. 623.
- Nitrogen Inhalation Therapy for Schizophrenia: Preliminary Report on Technique. F. A. D. Alexander and H. E. Himwich, Albany, N. Y.—p. 643.
- Physiologic Studies of Experimental Insulin and Metrazol Shock: II. Vascular and Respiratory Responses During Metrazol Convulsions. D. W. Loughhead and G. E. Hall, Toronto.—p. 657.
- Results of Shock Therapy in Treatment of Affective Disorders. D. C. Wilson, University, Va.—p. 673.
- Comparative Study of Hypoglycemic Shock Treatment and Control Observation in Schizophrenia. J. Notkin, C. E. Niles, F. J. DeNatale and G. Wittman, Poughkeepsie, N. Y.—p. 681.
- Glucose and Insulin Tolerance: Relation to Insulin Shock Treatment. M. Kaplan and A. A. Low, Chicago.—p. 689.
- Metrazol Reaction in Patients with Arterial Hypotension. Alexandra Adler, Boston, and Hosea W. McAdoo, Arlington, Mass.—p. 699.
- Subclinical Pellagra—Psychotic Type—Treated Successfully with Coramine (Nicotinic Acid): Case. M. H. Weinberg, Pittsburgh.—p. 701.
- Psychiatric Aspects of Porencephaly. E. L. Bernstein, Arlington Heights, Mass.—p. 723.

Metrazol for Acute Alcoholism.—Orenstein and his collaborators treated two types of acute alcoholism with metrazol. One type consisted of a group of thirty-four patients who had a history and evidence of recent alcoholism and a clinical picture of acute disturbance, resistance and violence; the other group of sixteen patients had the same history as the first and deep coma or coma complicated by respiratory failure. Immediately after admission such patients were taken to the emergency room and were given intravenously 5 cc. of a 10 per cent solution of metrazol, the rate of injection being about thirty seconds for the 5 cc. This speed of injection failed to induce a general convulsion in the patients narcotized with alcohol. In some individuals, twitching of the face appeared. The authors refer to this dose and time factor as a "subconvulsive dose," that is the dose is large enough to stimulate the central nervous system notably but does not lead to a generalized seizure. Sedation and other treatment were ordered as indicated. A large number of the excited patients would quiet down in from two to ten minutes after the injection and no further special treatment would be necessary. Comatose patients frequently regained consciousness in from five to thirty minutes and were able to give an adequate admission history. Twenty-five of the thirty-four excited patients improved within twenty minutes after the injection of metrazol, that is the acute symptoms of excitement disappeared. Ten of the sixteen comatose patients improved within thirty minutes, that is they awakened within this time or there was a change in their respiratory function with a clearing of the cyanosis or other alarming signs.

Psychoses Associated with Epilepsy.—Clark and Lesko state that in one year twenty-two patients were admitted to the Boston Psychopathic Hospital because of psychoses associated with epileptic seizures not complicated by syphilis, brain tumor, recent head injury or other causes of extensive damage to the central nervous system. Fourteen of the patients had clouded states, three chronic psychoses, one deterioration with psychoses and one a severe behavior disorder, and three could not be classified. Their ages, on first becoming mentally ill, ranged from 12 to 49 years. In all a considerable interval (from two to forty-five years, average about fifteen years) elapsed between the onset of their seizures and their first attack of mental

illness. Their family histories with one exception (a family history of epilepsy) were not remarkable. Only four other patients were known to have a parent with signs of nervous abnormality: two alcoholic, one depressed and one migrainous. Eleven patients had early cerebral damage although there were no residual neurologic signs. All patients had typical grand mal attacks without localizing features; five also had petit mal attacks. The frequency of seizures varied greatly, one patient having only nine observed seizures in the previous six years, another having grand mal attacks up to seven times daily. The average was about once a month. Patients with clouded states had the condition from about half a day to thirty-five days, with an average of four and a half days for twenty-one episodes. Usually these states were preceded by one or more grand mal seizures. All the patients with clouded states were overactive at some time (from mere restlessness to extreme combativeness and assaultiveness). Only two were stuporous for short periods. Speech and mood were variable. Delusions were manifested by twelve patients. Twelve had hallucinations, eleven of whom had delusions as well. Six had visions, including dead people, snakes, pigs, bugs, pigmy men and various living people. Seven had auditory hallucinations, including voices, music and the sound of airplanes. There were no olfactory, tactile or gustatory hallucinations. Of those who responded to questions, only two had unimpaired memories. The memories of others were better preserved for remote than for recent events. When orientation could be determined, it was poor in all but one case. Insight during attacks was absent in those with great overactivity and disturbed moods, while in calmer patients insight was partially present. The degree of amnesia for the attack after recovery was greatest when the most excitement prevailed during the psychosis and was least in the more elaborate, dream-like states. The clouded states were comparable to alcoholic intoxication. The neuropathologic processes underlying these conditions are unknown. There is great need of research in this field.

American Journal of Public Health, New York

30: 1-118 (Jan.) 1940

- The National Health Program: Present Status. A. Wolman, Baltimore.—p. 1.
- The Physician's Part in Organized Medical Care. H. Emerson, New York.—p. 9.
- Industrial Hygiene for the Smaller Plant. G. S. Everts, Philadelphia.—p. 17.
- *Study of Deaths from Farm Accidents in Alabama. J. N. Baker, Montgomery, Ala.—p. 22.
- School Health Education. W. H. Brown, Palo Alto, Calif.—p. 35.
- Differentiation and Identification of Bacillary Incitants of Dysentery. M. B. Coleman, Albany, N. Y.—p. 39.
- An Outbreak of Shiga Dysentery in Michigan, 1938. N. Berneta Block and W. Ferguson, Lansing, Mich.—p. 43.
- Studies of Acute Diarrheal Diseases: III. Infections Due to the "Newcastle Dysentery Bacillus." A. V. Hardy, New York; J. Watt, Albany, Ga.; M. H. Kolodny, New York, and Thelma DeCapito, Albany, Ga.—p. 53.
- Studies of Toxicity of Basic Fuchsin for Certain Bacteria. Cassandra Ritter, Lawrence, Kan.—p. 59.
- The National Plumbing Laboratory. F. M. Dawson and A. A. Kalinske, Iowa City.—p. 66.
- Comparative Efficiency of Endo, Lithium Chloride Endo, Desoxycholate Citrate and Bismuth Sulfite Mediums for Isolation of *Eberthella Typhosa*. Catherine R. Mayfield and Maud Gober, Jackson, Miss.—p. 69.
- Studies on Typhus Vaccine Prepared from Agar-Tissue Culture. S. H. Zia, K. H. Pang and P. Y. Liu, Peking, China.—p. 77.

Deaths from Farm Accidents in Alabama.—Baker presents data secured through accident questionnaires collected over seven years (1932-1938) by the Bureau of Vital Statistics. Every certificate of death filed in the Bureau of Vital Statistics of the Alabama State Board of Health on which the medical certification gave an accidental cause of death was queried. Of 309 deaths from farm industrial accidents recorded 186 deaths were of white persons and 123 of Negroes. Only eighteen were women. Of the deaths 46 per cent occurred during the four summer months. About one third of the deaths occurred instantly; one half within twenty-four hours and 78 per cent within one week. The interval between the time of the accident and death ranged from instant death to a maximum of 932 days. Of all known farming activities, cutting and sawing lumber was recorded once for every five farm industrial deaths. In three out of four deaths from this activity a falling object was the destroying agent; 79 per cent of these objects were falling trees.

Caring for animals was the cause of thirty-seven deaths. Fourteen of these deaths involved mules and in ten instances the animal kicked its victim to death. Plowing was the third activity in importance, resulting in thirty-one deaths, ten of which were from being struck by lightning. Eight were attributed to sunstroke. Driving vehicles caused the death of twenty-two persons, three fourths of whom fell—fourteen from wagons and two from trucks. Clearing of land was the fifth activity of importance, resulting in seventeen deaths, more than three fourths of which were caused by burns. Of equal importance to the activity of clearing land was that of riding animals, which also resulted in seventeen deaths. Eleven of the deaths were caused by the rider becoming entangled in the harness and being dragged by mules. About one half of the deaths from riding animals were of young people (10 to 14 years of age). Almost all of the decedents in this category were less than 25 years of age. From 1933 to 1938 inclusive there were 1,594 lives sacrificed by accidents in farm homes (deaths of persons residing on farms but not gainfully employed at the time). Of these 960 were white persons and 634 were Negroes; 512 and 325 respectively were women. Only one fourth of the fatal home accidents occurred during the four summer months; 40 per cent of the home accidents occurred during four winter months (October-January). Just as in the case of farm industrial accidents, a large number of the decedents die shortly after the accident occurs. Playing comprised one out of five of all activities ending in death, and burns constituted the destructive agency in more than half of the deaths (115) which occurred while playing. Almost all of the victims were less than 5 years of age. Falls were the second most important agency of injury in the playing group. Of twenty-one gunshot deaths, fifteen were the result of some one playing other than the decedent. There were 185 deaths from accidents which occurred while walking. Falls accounted for 51.1 per cent of these deaths. Sleeping, the third most important (13.5 per cent) activity, was associated with 159 accidental deaths, 56 per cent of which were from suffocation. The agency of injury second in importance in this group was burns (burning buildings). Standing was associated with the death of 134 individuals. Standing before an open fire was the origin of fifty-nine of these deaths. Falls, the second agency of injury in importance, accounted for twenty-six deaths. Eating and drinking, the activity fifth in importance, terminated fatally for 120 persons, of which number ninety-five were attributed to poisoning. Food poisonings totaled forty-five. Of the fifty remaining deaths, twenty-three were from lye poisoning. Rat poison was charged with four deaths, kerosene with three. Twenty-four of the eating deaths were from suffocation, fourteen of which were caused by foreign bodies. Falls from the sitting position caused nineteen deaths. The taking of medicine resulted in twelve deaths. A "patent medicine" for the treatment of worms caused one death. In two instances oil of chenopodium was concerned. Forty-four fatalities were in homes in which the decedent lived alone or was alone at the time of the accident; sixteen were infants of 1 year or less; five infants crawled into open fires. Information on the prevention of farm accidents should be made available to all schools and to the farm group.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

24:1-132 (Jan.) 1940

- Early Syphilitic Osteomyelitis: Report of Two Cases. U. J. Wile and D. G. Welton, Ann Arbor, Mich.—p. 1.
Lobelia as Sure Cure for Venereal Disease. Esther Louise Larsen, Washington, D. C.—p. 13.
*Menstrual Cycle and Blood Serologic Test for Syphilis. N. R. Ingraham Jr. and Verna R. Mayer, Philadelphia.—p. 23.
Wassermann Test: XVII. Effect of Antisyphilitic Drugs on Wassermann Reaction. D. L. Belding, Boston.—p. 29.
Gummatous Mastitis. A. L. Braunstein and R. D. Woolsey, Baltimore.—p. 43.
Use of Protargin in Seroresistant Syphilis. H. Pariser, Philadelphia.—p. 48.
Ecthyma Cutis Medicamentosa: Report of Case Caused by Other Than Antisyphilitic Drug (Quicamphol). M. B. Sulzberger and R. L. Baer, New York.—p. 50.

Menstrual Cycle and Serologic Test for Syphilis.—The occasional clinical observation that an apparently false positive blood serologic test for syphilis can be obtained at about the time of menstruation has led Ingraham and Mayer to perform 292 separate tests on sixty-six specimens of blood obtained from seventeen healthy young women. The blood samples were studied on various days of the menstrual cycle. The results

were uniformly negative throughout. The conclusion is that false positive serologic tests occurring during the menstrual cycle must result from a peculiarity of the individual or of the test and do not arise from any uniform blood changes occurring in all women. The incidence of occasional exceptional cases can be deduced only by studies of large groups of women.

Annals of Surgery, Philadelphia

111:1-160 (Jan.) 1940

- *Vitamin C Studies on Surgical Patients. M. K. Bartlett, C. M. Jones and Anna E. Ryan, Boston.—p. 1.
Motor Functions of Stomach After Resection. S. F. Vitkin, Sverdlovsk, Soviet Union.—p. 27.
Subperiatal Rupture of Intestine Due to Muscular Effort: Report of Two Cases. S. F. MacMillan, Schenectady, N. Y.—p. 49.
*Use of Sulfanilamide in Treatment of Peritonitis Associated with Appendicitis. I. S. Ravdin, J. E. Rhoads and J. S. Lockwood, Philadelphia.—p. 53.
Mikulicz Procedure, with Special Reference to Late Results in Management of Carcinoma of Colon. H. Patterson and A. Webb Jr., New York.—p. 64.
Adaptation of Mikulicz Operation for Right Colon and Rectosigmoid. R. F. Carter, L. R. Slattery and R. C. Hahn, New York.—p. 80.
Diagnostic Paracentesis in Suspected Intra-Abdominal Hemorrhage. C. C. Johnston, Lexington, Ky.—p. 93.
Rectal Malformation: Case Report. G. W. Ault, Washington, D. C.—p. 96.
Chronic Hypertension Produced by Carotid Sinus and Aortic-Depressor Nerve Section. S. J. G. Nowak, Boston.—p. 102.
Pheochromocytoma: Case Report. E. C. Baumgarten and M. O. Cantor, Detroit.—p. 112.
Modified Form of Lumbar Sympathectomy for Denervating Blood Vessels of Leg and Foot: Anatomic Considerations: Preliminary Report. L. N. Atlas, Cleveland.—p. 117.
*New Incision for Closed Space Infection (Felon) Involving Distal Phalanx of Finger. J. J. Weiner, New York.—p. 126.
Luxation of Extensor Tendons in Hand. F. H. Straus, Chicago.—p. 135.
Method for Continuous Spinal Anesthesia: Preliminary Report. W. T. Lemmon, Philadelphia.—p. 141.

Vitamin C and Surgery.—Bartlett and his associates determined the vitamin C content of the blood plasma of thirteen normal subjects and of 188 patients to be operated on. The thirteen control subjects showed a blood plasma content varying from 0.77 to 1.62 mg. per hundred cubic centimeters, with an average of 1.24 mg. Of the 188 patients on whom fasting determinations were made the average blood plasma level was 0.43 mg. per hundred cubic centimeters, with a variation from zero to 1.89 mg. As a concentration below 0.5 mg. per hundred cubic centimeters was obtained in 126 of the patients, this may be considered definitely abnormal with respect to their vitamin C metabolism. To determine whether the type of disease has a bearing on the degree of depletion the patients were divided into several groups, and also the vitamin C content, with its possible effect on the healing process, was determined postoperatively. The authors feel that the consistent fall in the plasma vitamin C observed after operation cannot be accounted for entirely on the basis of decrease in vitamin C intake. Most of the patients studied were allowed fluids by mouth, including fresh fruit juice, immediately after operation, so that an adequate supply of vitamin C was available throughout the postoperative interval. The drop in the plasma vitamin C in several instances was far too abrupt to be accounted for on the basis of starvation alone, even if the diet after operation contained no vitamin C. The changes in contour observed in the clearance curves after operation do not seem to be dependent on a decrease in vitamin C intake, the amount of parenteral fluid administered or the type of anesthesia. There is some evidence which suggests that the magnitude of the surgical procedure is related to the extent and duration of the postoperative alteration in the curves. The general preoperative nutritional state and especially the degree of vitamin C depletion seems to be another important factor. If the preoperative nutrition is good and the vitamin C is not depleted the more extensive surgical procedures cause a less marked change in the postoperative vitamin C clearance curves. A fall in the fasting plasma level of ascorbic acid occurs immediately after operation with a gradual return to the preoperative level, and when an intravenous dose of 1,000 mg. of ascorbic acid is given it is removed from the blood stream more rapidly than before operation, possibly because of an increased need for this substance during the process of tissue repair and wound healing. Depletion of vitamin C is found in patients with a variety of pathologic conditions.

Sulfanilamide for Appendical Peritonitis.—In 1936 Ravdin and his colleagues began to use sulfanilamide in spreading peritonitis associated with acute appendical infections and

also when it was feared that a spreading infection might develop. A compilation of the mortality figures in 809 consecutive cases of acute appendicitis shows that the mortality has been reduced from 1.5 per cent of the 552 patients operated on previous to the use of sulfanilamide to 0.4 per cent of the following 257. The improvement, they believe, can be attributed only to the employment of sulfanilamide, as no other known factor was changed. A number of patients with extensive peritoneal infection secondary to appendicitis recovered with much less reaction than would have been predicted on the basis of experience with the first 552 cases. All the available evidence indicates that the peritoneum is a favorable site for the action of sulfanilamide. It appears that the character of the lesion is more important than the specificity of the organism in determining the effectiveness of the drug. No instance of intestinal obstruction due to adhesions has been encountered since suction drainage of the stomach has been employed.

New Incision for Infections Involving Fingertips.—Weiner describes a new incision for closed space infections which appears to eliminate the objectionable features of other incisions. Under gas-oxygen anesthesia the nail is detached from the skin, nail bed and matrix. An inverted U shaped incision is made close to the tuft of the bone and part of the shaft of the distal phalanx. The perpendicular fibers are cut close to the bone. The pulp is retracted and the closed space is entered. The abscess (felon) is found lying just anterior to the distal phalanx. The mushroom portion of bone is carefully examined for evidences of osteomyelitis and if signs of softening are present the tuft is removed. The abscess cavity is emptied and the necrotic tissue in the anterior space, if present, is cut away and iodoform gauze is packed into the cavity. Wet dressings of boric acid are applied. The patient is instructed to soak the finger in hot boric acid solution every two hours for twenty minutes. The packing is removed in forty-eight hours. The author states that the advantages of the incision are that the bone is brought closer to the surface and less soft tissue has to be cut through, early osteomyelitis can be detected long before a roentgenogram reveals such destruction, adequate drainage is obtained, the wound heals in a shorter time, if a sequestrum forms it can be easily extruded, scarring is absent as the nail regenerates and covers the scar, and sensation is unimpaired.

Archives of Internal Medicine, Chicago

65:1-220 (Jan.) 1940

- *Treatment of Multiple Sclerosis with Nicotinic Acid and Vitamin B₁: Preliminary Report. M. T. Moore, Philadelphia.—p. 1.
- Effect of Reticulocytogenic Principle in Urine in Treatment of Pernicious Anemia. G. E. Wakerlin, Chicago.—p. 21.
- Disseminated Lupus Erythematosus: Cutaneous Manifestation of Systemic Disease (Libman-Sacks): Report of Case. A. M. Ginzler and T. T. Fox, New York.—p. 26.
- Primary Sarcoma of Pericardium: Report of Case. R. L. Parker, A. H. Bagenstoss and T. J. Dry, Rochester, Minn.—p. 51.
- Evaluation of Therapy in Myasthenia Gravis. N. S. Schlezinger, Philadelphia.—p. 60.
- *Atrophic Gastritis: Gastroscopic Studies on Effects of Liver and Iron Therapy: Preliminary Report. R. Schindler, J. B. Kirsner and W. L. Palmer, Chicago.—p. 78.
- *Vitamin A Deficiency in Diabetes Mellitus. J. G. Braxer and A. C. Curtis, Ann Arbor, Mich.—p. 90.
- Syndrome of Pseudobulbar Palsy: Anatomic and Physiologic Analysis. O. R. Langworthy and F. H. Hesser, Baltimore.—p. 106.
- Pre-natal Administration of Sedormid (Allylisopropyl-urethane): Observations and Report of Case. J. B. Kirsner, San Francisco.—p. 122.
- *Epidemic Disease of Respiratory Tract. H. A. Reimann and W. P. Havens, Philadelphia.—p. 138.
- Effect of Renal Retention of Vitamin C on Saturation Tests: Formula for Compensation of This Factor of Error. J. B. Ludden and I. Wright, New York.—p. 151.
- Fever in Congestive Heart Failure. Dera Kinsey and P. D. White, Boston.—p. 163.
- Basal Secretion of Digestive Enzymes in Old Age. J. Meyer, E. Spier and F. Neuweit, Chicago.—p. 171.
- Clinical Studies in Circulatory Adjustments: VI. Physiologic Relation Between Posture and Cardiac Output. A. A. Goldbloom, M. L. Kramer and A. Lieberman, with technical assistance of P. K. Rohit, New York.—p. 178.
- Allergy: Review of Literature of 1939. F. M. Rackemann, Boston.—p. 185.

Nicotinic Acid and Vitamin B₁ for Multiple Sclerosis.—Moore reports five cases of advanced multiple sclerosis in which nicotinic acid therapy was used, in the first case on Feb. 15, 1938, and has been used almost continuously, with a few interruptions, until the time of writing. Until June 1938 the

nicotinic acid was given intramuscularly (from 60 to 120 mg. in 10 cc. of sterile physiologic solution of sodium chloride) on alternate week days. After June 4, 1938, the drug was given intramuscularly exclusively, in doses varying from 80 to 140 mg., two or three times a week, depending on the patient's reaction. At this time the use of vitamin B₁ (thiamin chloride) was begun and 3.32 mg. (1,000 international units) was administered intravenously at the height of the cutaneous hyperemia. After July 18, 10 cc. of nicotinic acid and thiamin chloride combined in solution with sterile distilled water was injected intramuscularly into the buttocks, each cubic centimeter containing 12 mg. of nicotinic acid and 3.32 mg. of thiamin chloride. The solution was heated to about 110 F. and drawn into a warm syringe barrel immediately before injection; otherwise the characteristic flushing of the skin and body warmth did not occur. Prior to the use of nicotinic acid and vitamin B₁ the five patients received various treatments. Only hyperpyrexia appeared to produce a temporary improvement in most instances, except in case 5, in which the condition was made worse. The beneficial effects of vasodilatation and increased blood flow achieved by fever therapy and sympathectomy could be obtained with nicotinic acid without the dangers incident to these methods. Improvement followed the parenteral use of nicotinic acid and vitamin B₁ in the five cases of multiple sclerosis. Nicotinic acid produces vasodilatation and increased blood flow in the brain and spinal cord. The rise of cerebrospinal fluid pressure, as observed in cases 1 and 4, following the injection of nicotinic acid and, coming on coincidentally with the subjective feeling of warmth and the objective appearance of flushing of the skin, was presumptive evidence of vasodilatation within the brain. The exposed brain and cervicothoracic portion of the cord of the cat showed vasodilatation both visually and photographically after the intramuscular injection of nicotinic acid; this was most evident at the height of "pinking" of the cat's tongue and dental mucous membrane. When nicotinic acid-vitamin B₁ therapy was discontinued for any length of time, incapacitating spasticity and incoordination returned in every case. These symptoms were ameliorated within several days, or at most a fortnight, on restitution of treatment. To date untoward effects of prolonged treatment with nicotinic acid and vitamin B₁ have not been encountered, and laboratory and electrocardiographic studies have not shown evidence of harmful effects. Complete remissions have not been achieved. On the other hand, these cases were instances of advanced multiple sclerosis in which many forms of therapy had been used without appreciably arresting the progress of the disease. After treatment with nicotinic acid and thiamin chloride every patient noticed improvement in bodily movements and in walking: Patient 2 has been restored to her aptitude at the piano and has lost the annoying paresthesias. Patient 4 is now able to stand and has overcome much of his extreme spasticity. Patient 5 is no longer bedridden; he can move his legs and stand while assisted and use his arms, which were previously powerless, for purposes of dressing and eating. What effect nicotinic acid-vitamin B₁ therapy may have in cases of early multiple sclerosis is still to be determined.

Effect of Liver and Iron Therapy on Atrophic Gastritis.—Schindler and his associates employed substitution therapy (liver and iron) in eight cases of atrophic gastritis not associated with pernicious anemia, combined cord degeneration, sprue or pellagra. Only cases were chosen in which the gastroscopic appearance was marked and in which repeated gastroscopic examinations were possible. The developments in case 1, a case of untreated atrophic gastritis, are reported as control observations. Cases 2, 3 and 4 are instances of severe atrophic gastritis in which substitution therapy was unsuccessful. In cases 5, 6, 7 and 8 liver therapy led to the apparent regeneration of the gastric mucosa. In case 9 liver therapy was unsuccessful, while treatment with iron was followed by mucosal regeneration. In case 1, not treated by substitution therapy, gastroscopic check eight months after the initial gastroscopic examination showed no essential change in the mucosa, although clinical improvement occurred with a bland diet and sedatives. In case 5 spectacular improvement of extensive atrophic gastritis followed the first course of liver therapy, although slight areas of atrophy still were visible. The original picture reappeared after liver therapy was discontinued. There was no improvement after a second

course of therapy. Further study is required to evaluate its effectiveness. The case is of interest because free hydrochloric acid appeared after liver therapy, perhaps suggesting a true regeneration of functionally active glandular structures in the stomach, even though the improvement was temporary. Case 6 is the first instance of marked atrophic gastritis in which an apparent improvement was observed following liver therapy. The significance of the therapeutic result was further emphasized by the reappearance of the typical gastroscopic signs of atrophic gastritis after the patient discontinued treatment. Spontaneous improvement of severe atrophic gastritis was observed in case 7. Three gastroscopic examinations before the institution of liver therapy showed no improvement in this case and serve as control observations. The sudden disappearance of the atrophy following a brief period of liver therapy suggests a specific therapeutic result. A definite improvement of the atrophic gastritis in case 8 followed liver therapy. The case demonstrates that free hydrochloric acid may be present despite extensive atrophy of the gastric mucosa. In case 9 apparent healing of the atrophic gastritis associated with hypochromic anemia followed iron therapy. Apparent healing of atrophic gastritis following iron therapy has been described by Chevallier and Moutier and by Schiff and Goodman. This is the first case in which the authors have made the same observation. It is impossible at present to say whether or not the apparent regeneration of the gastric mucosa is genuine, i. e. due to the formation of new glands. Microscopic studies are necessary to solve this question. Substitution therapy, such as the administration of liver, iron or vitamins, is justified in the treatment of atrophic gastritis as an approach to clarifying the nature and pathogenesis of this condition. However, control studies, prolonged observation and competent interpretation of the changes are necessary before evaluation of such therapy is possible.

Vitamin A Deficiency in Diabetes Mellitus.—Brazer and Curtis observed twenty patients with juvenile diabetes mellitus and found that all of them had poor light adaptation by the Frober-Faybor biophotometer. Three of the group were subjectively aware of night blindness and nine showed cutaneous changes compatible with vitamin A deficiency. The daily administration of 60,000 U. S. P. units of vitamin A, in the form of crystalline carotene dissolved in vegetable oil, for as long as fourteen days did not affect the light adaptation of the patients. The daily administration of 60,000 U. S. P. units of vitamin A, in the form of concentrated fish liver oils, caused the patients' light adaptation to return to normal or nearly normal in from three to twenty-one days. The cause of poor light adaptation in patients with juvenile diabetes mellitus appears to be an inability to convert carotene to vitamin A.

Epidemic Disease of Respiratory Tract.—Reimann and Havens state that in the spring of 1938 eight cases of a severe form of atypical pneumonia were studied at the Jefferson Medical College Hospital; further cases occurred among the hospital personnel in August, November and December. Epidemics of similar disease were observed in Ohio, Delaware, Oregon, New York, Minnesota, Missouri and elsewhere. In January 1939 an epidemic of a mild disease of the respiratory tract began in Philadelphia, which reached widespread proportions in February. Similar outbreaks, with a high morbidity rate, were reported from New York, Minnesota, Illinois, England, France and elsewhere at about the same time. The authors limited their observations chiefly to the interns, nurses and medical students comprising a group of 813 persons, of whom 407 were ill presumably of the same disease. The authors believe that the incubation period is perhaps one or two days, but others have suggested that it is two weeks. The disease was primarily an inflammation of the mucous membranes of the respiratory tract, usually of the nose, pharynx and larynx, occasionally including the trachea and bronchi, and in a few cases the bronchioles and lungs. Constitutional symptoms were usually in proportion to the extent and intensity of the mucosal inflammation. The clinical course was remarkably uniform in most cases, differing chiefly in degree of severity. Nasopharyngolaryngitis was present in 88 per cent of the cases, tracheobronchitis in 6 per cent and tracheobronchopneumonia in addition in 6 per cent. In most of the cases of severe illness the lungs were presumably involved by the infectious agent suspected, without the agency of the

usual varieties of bacteria. There were no serious complications, and all the patients recovered. The disease resembles epidemic influenza in many respects but is caused by a different agent. The disease should perhaps be given a temporary general name such as grip (as dissociated from true influenza) until the etiologic agent is discovered. Many features of the disease, such as its epidemiology, the close resemblance to other diseases known to be caused by filtrable viruses, the normal leukocyte count and the absence of evident causative bacteria, suggest to the authors that a filtrable virus is the cause.

California and Western Medicine, San Francisco

52:1-50 (Jan.) 1940

- National Department of Health Proposed in 1871 by Thomas M. Logan, M.D., of California. W. M. Dickie, San Francisco.—p. 6.
 *Alcohol Tolerance: Its Importance in Relation to Chemical Tests for Drunkenness. H. W. Newman, San Francisco.—p. 9.
 Alcoholism: Its Psychiatric Treatment. J. L. Henderson, Compton.—p. 11.
 Malignant Melanoma: Statistical and Pathologic Review of Thirty-Five Cases. L. R. Taussig and Frances A. Torrey, San Francisco.—p. 15.
 Endometrium in Menstrual Disturbances of Climacteric. Gertrude Flint Jones, San Francisco.—p. 18.
 Spinal Anesthesia. L. L. Stanley, San Quentin.—p. 20.
 Refrigerated Cartilage Isografts: Their Source, Storage and Use. G. B. O'Connor, San Francisco.—p. 21.
 Quantitative Methods in Diagnosis of Brain Tumors. W. T. Grant, Los Angeles.—p. 23.
 Venereal Lymphogranuloma: Public Health Aspects. J. C. Geiger and C. Mathewson Jr., San Francisco.—p. 25.
 Benjamin Franklin Keene. G. P. Jones, San Francisco.—p. 27.

Alcohol Tolerance.—Newman has endeavored to determine whether there is enough individual tolerance to alcohol to affect the validity of blood-alcohol concentration tests. Accepting as a hypothesis that acquired tolerance did occur, the mechanism which might bring it about was determined. A series of dogs was given a test dose of alcohol—first gastrically and after an interval of a few days intravenously. A period of thirteen months was then allowed to elapse, during which time the animals had as their only supply of fluid a 10 per cent solution of alcohol. They drank daily on an average about 7 cc. of alcohol per kilogram of body weight; the equivalent for a man of average weight would be about a quart of whisky daily. At the end of this time the test dose of alcohol was repeated and the curves of blood-alcohol concentration were found to coincide with those obtained before habituation. It is concluded that any tolerance developed by the dogs was not due to either decreased absorption or increased rate of metabolism of alcohol. To determine if tolerance actually did develop with habituation a fresh group of animals was subjected to the test dose of alcohol and not only the blood-alcohol concentration but also the neuromuscular behavior was observed during the period of intoxication. This was judged in nine purely arbitrary degrees. There was a certain divergence in the behavior of the individual dogs at the same blood-alcohol levels, indicating some degree of difference in inherent tolerance to alcohol. The period of habituation was then begun. It had previously been observed that the animals, when given free access to the alcohol solution during the twenty-four hours of the day, soon learned to drink only a little at a time and so never became very drunk. This was remedied by placing the alcohol solution in the cages for only a short period twice a day, with the result that the dogs became very drunk twice a day, while imbibing almost the same daily dose as the previous group. At the end of ninety-seven days they were subjected to the same procedure after the test dose as before. The rate of alcohol metabolism did not show a significant variation from that shown before habituation, but the degree of drunkenness at a given blood-alcohol level showed a consistent and marked decrease after habituation. The results between the abstinent and habituated animals indicate a clearcut acquired tolerance of all animals. That this tolerance is not permanent was demonstrated by its loss after seven months of abstinence. Thus, it is demonstrated that not only do dogs show an individual variation in tolerance to alcohol but the tolerance can be increased by habituation and again decreased after abstinence. If these results with dogs could be applied to the same problem in man, it is apparent that the same blood-alcohol concentration need not indicate the same degree of intoxication in one individual as in another, or even in the same individual should he change his drinking habits.

Endocrinology, Los Angeles

26:1-188 (Jan.) 1940. Partial Index

- *Acromegaly and Diabetes Mellitus. C. Coggeshall and H. F. Root, Boston.—p. 1.
- *Comparative Study of Metabolic Effects of Testosterone Propionate in Normal Men and Women and in Eunuchoidism. A. T. Kenyon, Kathryn Knowlton, Irene Sandiford, F. C. Koch and Gertrude Lotwin, Chicago.—p. 26.
- *Observations on Continued Use of Male Sex Hormone Over Long Periods of Time. J. Eidelberg and E. A. Ornstein, New York.—p. 46.
- *Mechanism of Estrin Therapy in Relief of Dysmenorrhea. S. H. Sturgis and F. Albright, Boston.—p. 68.
- Relation of Hyperemia to Action of Estrin. O. Hechter, M. Lev and S. Soskin, Chicago.—p. 73.
- Potency of Certain Commercial Hormone Preparations: Second Study. F. E. D'Amour, Denver.—p. 88.
- Biologic Potency of International Standard Chorionic Gonadotropin. F. E. D'Amour and Marie C. D'Amour, Denver.—p. 93.
- Relationship Between Thymus and Sexual Organs. H. Chiodi, Buenos Aires, Argentina.—p. 107.
- Output of Protein Metabolism Hormone of Pituitary Anterior Lobe. K. E. Paschkis, Philadelphia, and Annie Schwoner, Vienna, Germany.—p. 117.
- Autonomic Control of Thyroid Secretion. H. B. Friedgood and W. B. Cannon, Boston.—p. 142.

Acromegaly and Diabetes Mellitus.—Coggeshall and Root discuss the occurrence of twenty-six cases of diabetes among 153 acromegalic patients, evidences of hyperpituitarism with excessive height in three patients among diabetic patients, three frank cases of acromegaly and three of gigantism. The average interval between the onset of acromegaly in the twenty-six diabetic and the three patients with hyperthyroidism and that of diabetes was 9.2 years. A constitutional or hereditary predisposition to diabetes encountered in acromegaly is suggested by the existence of hereditary or familial diabetes in six of the twenty-nine cases, or 21 per cent, whereas among the relatives of the 127 cases of acromegaly without known diabetes only 2 per cent had diabetes. The obesity of 113 patients with acromegaly resembled that of diabetic patients in that 73 per cent of the acromegalic patients had been from 10 to 70 per cent above standard weight. Absence of the specific dynamic action of protein was observed in one case of acute hyperpituitarism at the beginning of a period of diabetic treatment; a subsequent test after treatment showed a normal specific dynamic action. During this period the basal metabolism fell from +34 to +1 per cent. Comparison was made of the weights of organs at necropsy between groups of patients with acromegaly, diabetes, combined acromegaly and diabetes and Simmonds' disease. Splanchnomegaly occurred only in the presence of acromegaly. Its absence in cases of ordinary diabetes argues against the possibility that persistent hyperpituitarism caused the diabetes. The possibility that a brief period of acute hyperpituitarism could produce permanent damage to the islets of Langerhans without splanchnomegaly remains. However, diabetes did not develop in four cases of fugitive acromegaly due to mixed tumors of the pituitary. At necropsy of fifty diabetic patients variations in the size of the pancreas were not associated with variations in the weight of other internal organs, such as was shown at necropsies of patients with acromegaly and Simmonds' disease. The clinical character of the diabetes associated with acromegaly does not show any greater variation in severity, resistance to insulin and duration of life than is seen in a large group of diabetic patients without acromegaly. An inconsistency between a blood sugar curve indicating insulin insensitivity and the fact that the patient had repeated insulin reactions was observed. The usual complications of diabetes including pyogenic infections, arteriosclerosis with gangrene and coronary atherosclerosis occurred. Coma may develop in cases of acromegaly with diabetes and therefore the same careful adjustment of diet and insulin is required as in cases of diabetes of similar severity without acromegaly. In certain mild cases of acromegaly and diabetes excessive polyphagia without loss of weight or development of acidosis resembled the diabetes produced by Young by the injection of anterior pituitary extract. His demonstration that degeneration of the islets of Langerhans and chronic diabetes can be produced in the dog by injection of large amounts of crude anterior pituitary extract of the cow provides a new method of studying the possible production of such changes in the human being with diabetes by such a diabetogenic substance.

Metabolic Effects of Testosterone Propionate.—Kenyon and his co-workers report further studies on the metabolic effects of testosterone propionate on eunuchoidism and compare these effects with those obtained in two normal men and two

normal women. The effect of testosterone by inunction on a eunuchoid was also studied. The results confirm their previous observations: that intramuscular injection, once or twice a day, of 25 mg. of testosterone propionate to a eunuchoid reduced the urinary excretion of nitrogen, sodium, potassium and chloride. A gain in weight was observed, due largely to water held in association with the salts and protein retained. A reduction in the urinary excretion of inorganic phosphorus accompanied that of the other constituents. During recovery sodium, chloride and water were rapidly lost from the body, inorganic phosphorus and potassium less rapidly and less completely, while stored nitrogen was retained in great part for weeks. The two normal young men responded like the eunuchoids, except that the 0.03 Gm. of nitrogen retained daily per kilogram of weight, during the period of maximal effect, was half that of the eunuchoids. One normal young woman responded essentially as the eunuchoids and the normal men. The other woman showed a definite reduction in the urinary excretion of inorganic phosphorus but otherwise distinctly less evidence of a testosterone propionate effect. The reasons for the differences between the women are not clear. The concentrations of urea and non-protein nitrogen of the blood were definitely reduced by such treatment, while those of hemoglobin, plasma proteins and serum sodium, potassium and chloride were unaffected. The reductions in urinary electrolyte excretion in the eunuchoid were unaccompanied by changes in urinary ammonia, hydrogen ion concentration, bicarbonate or concentration of titratable acid. Creatine excretion in the eunuchoid, intensified by ingestion of creatine, was substantially reduced by the androgen and increased during recovery. The daily percutaneous administration of 25 and 50 mg. of testosterone ointment to a eunuchoid produced diminution in the urinary excretion of nitrogen. The basal metabolic rate, fasting respiratory quotient, pulse rate and blood pressure of the normal subjects were not conspicuously affected by testosterone propionate. The basal metabolic rate of the eunuchoid was probably slightly increased; the pulse rate and blood pressure were unaffected. The 102.7 to 252.2 Gm. of protein estimated as retained by these subjects is not accounted for by increases in the bulk of genital tissues and represents deposit of new material elsewhere in the body. This together with the reduction in the urinary excretion of inorganic phosphorus, potassium and creatine points to a somatotrophic influence of androgens and provides a clue to the explanation of unusual body growth accompanying precocious puberty.

Continued Use of Testosterone Propionate.—Eidelsberg and Ornstein cite the effects of the continued administration of testosterone propionate to four hypogonadal males. On several occasions the erections have been too numerous and libido too pronounced. However, decreasing the dose or frequency of injection soon overcame this. Symptoms and signs of masculinity have been proportionately improved. Improvement in general well being and strength was most marked. The mental response and improvement in outlook were excellent. It is the authors' impression after using about 20,000 mg. of the preparation for the four subjects that as yet no real dangers have made their appearance. Several patients have been administering the material to themselves for about one year. It appears that the average weekly maintenance dose may be between 50 and 75 mg., sometimes more or less. The required dose apparently will vary from one patient to another. It seems that the response of the patients with simpler involvement, such as castrates or eunuchs, who were more or less normal originally, may be better than that of other patients, especially if treatment is not delayed too long after the pathologic condition appears. Patients with pituitary disorder (hypopituitarism, infantilism, Lorain-Levi syndrome, Fröhlich's syndrome) will respond better than the older patients from 20 to 30 or more years of age. Occasionally treatment may be discontinued without regression, but usually it must be continued, just as with other endocrine replacement therapy. The potential dangers of unrestricted sale and consequent indiscriminate use become apparent to all interested in the problem. Three of the four patients have since been subjected to subcutaneous implantation of pure testosterone tablets. In each instance the full and dramatic effects of the testosterone propionate, as evidenced by the previous injections, were maintained.

Estrogen and Dysmenorrhea.—Sturgis and Albright used estradiol benzoate (progynon B), 1 cc. of which contained 1.7 mg. (10,000 rat units) of the substance, in the treatment of twenty-five cases of severe dysmenorrhea. The dose was injected intramuscularly every third day. A course of treatment consisted of from three to fourteen injections. The immediate result of a series of such injections depended entirely on how soon in the menstrual cycle the injections were started. If the first of a series of from six to ten or twelve injections was given within the first week after the onset of the menses, the next period was invariably free from uterine cramps. If the series was not started until two weeks after the onset of the previous flow, there was no change in the pains during the subsequent menstruation. Although a completely cramp-free period followed a course of treatment if started early enough in the cycle, the next menses, when no estrogen had been given, was as painful as ever. Endometrial biopsies have furnished evidence that the immediate relief from estrogen treatment depends on the suppression of ovulation. Every biopsy of material taken before a painful period showed evidence of ovulation, whereas every biopsy obtained after treatment and before a period free from cramps showed no evidence of ovulation. When it was possible to take biopsies for three consecutive months it was shown that estrogen treatment for one month did not inhibit or repress ovulation during the next month. Over a period of from six to eighteen months eighty-two courses of injections have been given. In sixty-three of the periods directly following such treatment the patients were free from cramps. An analysis of the nineteen failures shows that in seventeen the injections were not properly timed for the individual case, the number of injections was insufficient or that treatment was given for two consecutive months. A few of the patients studied who have received estrogen on alternate months for at least a year have appeared to show a gradual improvement in the severity of the cramps in the months when no injections were given. It is too early to come to conclusions concerning the permanent value of this therapy. It seems probable that in some of these cases sufficient uterine growth can be produced to result in permanent mitigation of the pain.

Journal of Clinical Investigation, New York

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- Serum Phosphatase in Lymphomatoid Diseases. H. Q. Woodard and L. F. Craver, New York.—p. 1.
- Precipitin Studies in Nephrosis and Nephritis. E. Goettsch and J. D. Lyttle, New York.—p. 9.
- Nature of Peripheral Resistance in Arterial Hypertension. E. A. Stead Jr. and P. Kunkel, Boston.—p. 25.
- *Circulation in Athletes. H. J. Stewart and R. F. Watson, New York.—p. 35.
- Serum Lipids and Proteins in Hyperthyroidism. E. B. Man, E. F. Gildea and J. P. Peters, New Haven, Conn.—p. 43.
- *Decrease of Gastric Secretion with Advancing Years: Further Observations. A. L. Bloomfield, San Francisco.—p. 61.
- Antistreptolysin Titer in Rheumatic Fever, Arthritis and Other Diseases. J. J. Bunim and C. McEwen, New York.—p. 75.
- Control of Dosage of Antiserum in Treatment of Pneumococcal Pneumonia: I. Study of Mechanism of Skin Reaction to Type Specific Polysaccharide. W. B. Wood Jr., Baltimore.—p. 95.
- *Id.: Clinical Application of the Francis Skin Test. W. B. Wood Jr., Baltimore.—p. 105.
- Effect of Disease of Liver and Biliary Tract on Phosphatase Activity of Serum. A. B. Gutman, K. B. Olson, Ethel Benedict Gutman and C. A. Flood, New York.—p. 129.
- Metabolic Disturbances in Experimental Human Vitamin B Deficiency. K. O. Elsom, F. D. W. Lukens, Esther H. Montgomery and L. Jonas, Philadelphia.—p. 153.
- Studies on Action of Sulfapyridine on Pneumococci. W. C. Spring Jr., F. C. Lowell and M. Finland, Boston.—p. 163.
- Immunologic Studies on Patients with Pneumococcal Pneumonia Treated with Sulfapyridine. M. Finland, W. C. Spring Jr. and F. C. Lowell, Boston.—p. 179.
- Bactericidal Action of Sodium Sulfapyridine and of Glucose-Sulfapyridine Solution in Human Blood. F. C. Lowell, W. C. Spring Jr. and M. Finland, Boston.—p. 215.
- Renal Function and Azotemia Following Hematemesis. R. J. Stevens, L. Schiff, Anna Lublin and Ellen S. Garber, Cincinnati.—p. 233.
- Immunity in Diabetes: III. Relation of Tissue Glycogen and Blood Chemistry to Bacterial Dissemination, Antibody Formation and Survival After Infection in Diabetes. R. Richardson, Philadelphia.—p. 239.

Circulation in Athletes.—Stewart and Watson studied the circulation of college athletes between 19 and 23 years of age and compared them with those of eleven normal individuals from 19 to 29 years of age engaged in ordinary sedentary occupations. Measurements were made of the arteriovenous oxygen

differences, oxygen consumption, minute volume output of the heart, vital capacity, cardiac size, circulation time, venous pressure, arterial pressure and heart rate. The results of the study show that, with one exception, there was no significant difference between the measurements of college athletes and those derived from the control group. The stroke volume of the athletes was slightly larger. This difference appears to be related to body size, since the stroke volume per kilogram of body weight and the cardiac index for the two groups are approximately the same.

Decrease of Gastric Secretion with Advancing Years.

—To determine whether a gradual decline of secretion takes place in every one or whether some people undergo an abrupt defection while others preserve their gastric juice unchanged into old age, Bloomfield reexamined five normal persons whose gastric secretions were determined more than ten years before. At the reexamination three of the five subjects showed practically identical gastric secretion, one showed slight decline of acidity but not of volume of secretion and one showed a definite decline both of volume and of acid. Why some normal people preserve their gastric secretion unaltered over many years while others show a rapid decline is obscure.

Value of Francis Skin Test in Pneumonia.

—Wood treated fifty-one patients with lobar pneumonia caused by type I, II, III, IV, V, VII and VIII pneumococci with antipneumococcus serum and he controlled the dosage of the antibody administered by frequent skin tests with the homologous pneumococcus polysaccharide (Francis skin test). Five patients reacted to the polysaccharide before antiserum had been given. In none of these cases could the Francis skin test be used as a guide to serum therapy. The amount of antibody required to control the pneumonia in the cases studied varied from 11,000 to 1,983,000 units. The author asserts that the use of the test made it possible to treat each patient intensively without wasting antiserum. In every case in which a crisis occurred the Francis skin reaction became positive several hours before or during the fall in temperature. The skin test served as a valuable aid in the early diagnosis of the complications of pneumonia. In every case in which fever persisted in the presence of a positive skin reaction pleurisy with effusion, empyema, meningitis or endocarditis was demonstrated subsequently. No patient survived the pneumonia if a positive reaction failed to develop. Three patients who died reacted positively shortly before death; two died of pneumococcal complications and the third died of uremia, no evidence of active pneumonia being found at necropsy. The Francis skin test was found of value also in determining the optimal dosage of antibody in the treatment of patients who had previously received sulfapyridine.

Journal Industrial Hygiene & Toxicology, Baltimore

22: 1-52 (Jan.) 1940

- *Prevention of Silicosis: Experimental Investigations on Action of Certain Nonsiliceous Dusts and Silica in Origin and Development of Silicosis. C. Naeslund, Stockholm, Sweden.—p. 1.
- Percentage of Particles of Different Sizes Removed from Dust-Laden Air by Breathing. A. M. van Wijk and H. S. Patterson, Johannesburg, South Africa.—p. 31.
- Studies on Detoxication Mechanism: I. Ability of Apple or Its Constituents to Counteract Toxic Effects of Lead and Arsenic. I. A. Manville, F. J. Reithel, P. M. Yamada, T. W. Spencer and J. R. Richardson, Portland, Ore.—p. 36.

Prevention of Silicosis.—From his experimental studies as to the prevention of silicosis, Naeslund concludes that: Chemically indifferent dusts such as coal (and even glass) did not bring about any obvious effect on the development of silicotic processes either inhibitive or in any promotive respect (through the enhancement of lymph stasis and the increase of cell aggregations in the silicotic areas). Silicosis and anthracosis appear to develop in the lungs (and lymph glands) quite independently and with no sign of any significant mutual collaboration between the reaction produced by silica and coal (anthracosilicosis). Inhaling alkaline dusts whose main effect presumably consists in a capacity to increase the solubility of silica in the lungs (soda and calcium hydroxide) without silica often caused irritations in the lungs and necrosis with inconsiderable fibrotic response. Similar changes took place after inhalation of these dusts together with silica but there were no direct signs of enhanced toxicity of the silicon in the lungs because these alkali-

line dusts were present. These animals manifested great susceptibility to pulmonary infections which, in early stages, led to death in the silicotic animals. This observation can possibly partly explain certain cases of death from "acute silicosis" among human beings who have inhaled quartz along with alkaline dusts. There was no support to the theory of increased solubility and enhanced toxicity of quartz by the simultaneous inhalation of alkaline dusts. Among dusts which may diminish the toxicity of silica are the positively charged metallic dusts. Of particular interest in this connection is metallic aluminum, which was shown to inhibit the effect of quartz dust. In contrast to the investigations of Robson, Irwin and Denny, complete protection against proliferative fibrosis due to silica was not obtained through the inhalation of metallic aluminum dust. However, it is yet too early to judge whether experimental results will hold good for human beings. Iron and magnesium dust also proved to possess a certain, if slight, inhibitory effect on silica. This effect is not without practical significance, especially in mining where mixed dusts are encountered. Greater attention should be given to the composition of inhaled dusts and to the combined effect of the separate products, as siliceous industrial dust is often mixed. Especially is this advisable when silicosis manifests divergence from what might be reasonably expected.

Laryngoscope, St. Louis

49: 1151-1236 (Dec.) 1939

- Abstracts from Literature Relating to Conditions in Trachea and Bronchi. C. J. Imperatori, New York.—p. 1151.
Peroral Endoscopy: Inception and Development of Peroral Endoscopy. M. C. Myerson, New York.—p. 1160.
Id.: Anesthesia. R. L. Moorhead, Brooklyn.—p. 1162.
Id.: Management of Bronchoscopic Clinic. D. H. Jones, New York.—p. 1165.
Id.: Indications for Direct Laryngoscopy and Bronchoscopy. R. Kramer, New York.—p. 1168.
Id.: Indications for Esophagoscopy, Gastroscopy and Duodenoscopy. C. J. Imperatori, New York.—p. 1178.
Id.: Contraindications to Endoscopy and Accidents. J. D. Kernan, New York.—p. 1184.
Id.: Single and Biplane Fluoroscopy. F. M. Law, New York.—p. 1189.
Id.: Pneumography: Technic and Interpretation. G. R. Brighton, New York.—p. 1192.
Pathogenesis of Otosclerosis. W. Sparer, New York.—p. 1199.
Post-Tonsillitic Deep Cervical Abscess and Internal Jugular Vein Thrombophlebitis: Report of Six Cases. P. Leibowitz and S. Weinstein, Brooklyn.—p. 1205.
Psychogenic Impediments of the Voice. E. Froeschels, St. Louis.—p. 1225.

Nebraska State Medical Journal, Lincoln

25: 1-40 (Jan.) 1940

- *Advances in Treatment of Dementia Paralytica by Combined Artificial Fever and Chemotherapy: Comparative Results in Early and Advanced Stages, Including Malarial Failures: Preliminary Report of Seventy Cases. A. E. Bennett, Omaha; J. C. Nielsen, Hastings, and A. H. Fechner, Lincoln.—p. 1.
Present Day Treatment of Pneumonia. E. M. Walsh, Omaha.—p. 6.
Sulfanilamide and Allied Azo Dyes in Treatment of Pneumonia. L. T. Hall, Omaha.—p. 12.
Why "Mary's Never Been the Same Since Johnnie Was Born." E. C. Sage, Omaha.—p. 15.
Genito-Urinary Diseases in General Practice. J. D. Bradley, Pender.—p. 17.

Artificial Fever and Chemotherapy for Dementia Paralytica.—In comparing the clinical remission rate of dementia paralytica following the various types of treatment, Bennett and his colleagues find that 12 per cent of patients obtained clinical remissions after chemotherapy (tryparsamide) alone, 42 per cent from malarial fever followed by chemotherapy and 53 per cent from combined artificial fever and chemotherapy. Of twenty patients with early dementia paralytica, a full remission was obtained in 65 per cent with partial improvement in 30 per cent. Complete serologic reversal of the spinal fluid was obtained in 40 per cent, with partial reversal in 30 per cent after combined artificial fever and chemotherapy. Of ten patients with dementia paralytica with tabes a full remission was obtained in 50 per cent and a partial one in 30 per cent. The spinal fluid was reversed completely in 40 per cent and partially reversed in 10 per cent. Of twenty-eight patients with advanced dementia paralytica committed to a state hospital, 54 per cent obtained a full clinical remission and 28 per cent a partial remission. A complete serologic reversal of the spinal fluid occurred in 28 per cent and a partial reversal in 50 per cent. Of twelve patients failing to obtain a full remission from malarial inoculation, 33½ per cent obtained a full remission and an additional 25 per

cent were improved following fever and chemotherapy. The spinal fluid was reversed to negative in 33 per cent and improved in 41 per cent. The results from artificial fever, fifty hours above 105 F., combined with mapharsen in the entire group of seventy cases of all stages of dementia paralytica, were full remissions of 53 per cent with an additional 28 per cent improved. A complete serologic reversal of the spinal fluid occurred in 34 per cent, with partial reversal in an additional 37 per cent.

New England Journal of Medicine, Boston

221: 1003-1044 (Dec. 28) 1939

- Empyema in Children. T. H. Lanman and H. L. Heyl, Boston.—p. 1003.
Rouleau Formation in Fresh, Unmodified Blood as Diagnostic Test for Hemolytic Anemia. W. Dameshek, Boston.—p. 1009.
Syndrome of Diabetes Mellitus, Hypertension and Nephrosis: Clinical and Pathologic Study of Case. H. A. Derow, M. D. Altschule and M. J. Schlesinger, Boston.—p. 1012.
*Effect of Amphetamine (Benzedrine) Sulfate and Paredrine Hydrobromide on Sodium Amytal Narcosis. A. Myerson, J. Loman, M. Rinkel and M. F. Leses, Boston.—p. 1015.
Chemical and Clinical Diagnosis of Acute Alcoholism. W. W. Jetter, Taunton, Mass.—p. 1019.
Current Epidemiologic Aspects of Scarlet Fever. J. E. Gordon, Boston.—p. 1024.

Effect of Amphetamine Sulfate on Sodium Amytal Narcosis.—Myerson and his associates say that in a previous study on the physiologic effects of amphetamine (benzedrine) sulfate they noted that the duration of the narcosis produced by the intravenous administration of sodium amytal was shortened if a subcutaneous injection of amphetamine was given either before or after the sodium amytal. Since then they have studied the effect of the drug given by the intravenous route, thinking that it would be even more effective in counteracting the narcotic effects of sodium amytal. This paper records the quantitative effects of amphetamine sulfate as well as of paredrine hydrobromide, another sympatheticomimetic amine, on the narcosis produced by sodium amytal. They find that amphetamine sulfate is effective in preventing or counteracting the narcosis produced by the intravenous administration of sodium amytal. This action and the fact that amphetamine causes a rapid and prolonged rise in blood pressure may be found useful in certain cases in which it seems desirable to overcome severe side reactions of the narcosis produced by the barbiturates, particularly respiratory embarrassment and pronounced decrease in blood pressure. Paredrine hydrobromide, although closely related to amphetamine, appears to have no effect on the narcosis produced by sodium amytal.

222: 1-40 (Jan. 4) 1940

- The Turn of the Century—and After. D. Cheever, Boston.—p. 1.
Intra-Abdominal Torsion of Appendices Epiploicae. R. E. Mahrey, Boston.—p. 12.
*Lung Abscess. D. D. Matson, Boston.—p. 15.
The Leukemias. H. Jackson Jr., Boston.—p. 22.

Lung Abscess.—Matson concludes that the majority of non-tuberculous pulmonary abscesses follow procedures of the upper respiratory tract or develop subsequent to unresolved pneumonia or other severe infections of the upper respiratory tract. A primary pulmonary lesion is apparently present before secondary infection with mouth organisms takes place; this may be infarction as a result of embolism or atelectasis as a result of bronchostenosis or bronchiolar obstruction. There is no single bacteriologic etiology. The flora of the full-blown abscess is usually complex, and the quantitative importance and possible synergism of the various organisms are not understood. Oral infection is disproportionately common among adult patients with lung abscess of unknown etiology. This type of abscess is rare in infants and children. The diagnosis of lung abscess usually is readily made from the history and general clinical picture, aided by roentgenography and bronchoscopy. The results of physical examination of the chest may be variable and inconclusive. Accurate localization is the most important prerequisite to both medical and surgical treatment. From 20 to 30 per cent of the cases heal with only supportive treatment, and all cases should receive an adequate trial of medical therapy, of which the most important feature is supervised postural drainage. Collapse therapy, either by pneumothorax or by more extensive operative procedures, should never be attempted unless

the abscess cavity has been adequately drained. In peripheral abscess with reaction of the overlying pleura, early external drainage seems to be indicated. In abscesses which fail to respond to medical therapy in two or three months, especially in children whose general condition is good, such radical surgery as lobectomy deserves early consideration in order to avoid progression to chronic pulmonary suppuration and gangrene. The prophylaxis of lung abscess includes careful operative technique, caution in operating on patients with any predisposition to atelectasis, close observance of lung ventilation during and after operation, and conservative surgery on the upper respiratory tract with the use, if possible, of local anesthesia, improved oral hygiene and adequate therapy of respiratory infection in the early stages.

Ohio State Medical Journal, Columbus

36: 1-120 (Jan.) 1940

- Medical Complications of Pregnancy. W. W. Herrick, New York.—p. 17.
Treatment of Gonorrheal Arthritis. R. M. Stecher and W. M. Solomon, Cleveland.—p. 24.
Hyperinsulinism Due to Adenoma of Pancreas: Fatal Outcome Due to Myocardial Failure: Autopsy Report. L. G. Heyn and L. Sommer, Cincinnati.—p. 27.
Combined Spinal Inhalation Anesthesia. B. B. Sankey and J. K. Potter, East Cleveland.—p. 29.
Some Physiologic Considerations of Heart Failure. R. C. Kirk, Columbus.—p. 31.
Early Forms of Neurosyphilis. J. L. Fetterman, Cleveland.—p. 35.
Artificial Fever Treatment in Infants and Children: Methods, Indications and Results. W. Heymann, Cleveland, and Lena S. Enright, Findlay.—p. 40.
Relation of Thyroid Gland to the Total Man. D. M. Palmer, Columbus.—p. 44.
*Acne Vulgaris: Therapeutic Survey. I. L. Schonberg, Cleveland.—p. 50.
Trichinosis: Incidence in Dayton, Ohio. M. Oosting, Galveston, Texas.—p. 53.
*Use of Histaminase in Treatment of Various Allergic Manifestations. J. Forman, Columbus.—p. 56.
Present Status of Tetanus Toxoid and Its Use in Immunizing Serum Sensitive Individuals. G. E. Rockwell, Cincinnati.—p. 59.

Acne Vulgaris.—Schonberg tabulated the results obtained in 216 cases of acne vulgaris by various methods of treatment. The ages of the patients varied between 12 and 35 years. Questionnaires were sent to many of the patients, and others were seen at the office at intervals of six months after cessation of active treatment. As most recurrences took place from six to twelve months following treatment, a period of fifteen months was the accepted interval to determine the outcome of each case. All patients were treated by indicated local applications before other therapeutic methods were instituted. If no improvement occurred after from four to twelve weeks of local therapy, other methods were employed. Local applications, vaccines and ultraviolet radiation were used for patients less than 16 years of age. Patients selected for roentgen therapy were those with the pustular, large papular and indurated types of acne which had persisted over a long period without improvement under the usual methods of treatment. It was necessary to employ roentgen therapy for 122 patients. The remaining ninety-four were given local therapy and indicated types of internal therapy. These included juvenile acne, seborrheic acne and mild papular acne. Of these, 50 per cent obtained satisfactory results after from one to twelve months of treatment; there were 27 per cent of recurrences from six to twelve months after treatment and these have recently been given roentgen therapy. Seborrheic acne was recalcitrant to roentgen therapy. Patients from 12 to 14 years of age with juvenile acne were resistant to all types of therapy, and methods were used to control rather than to cure the condition. Endocrine preparations were used for twelve patients, and four obtained satisfactory results. In these cases there was evidence of endocrine dysfunction. Of the 122 patients given roentgen therapy eighty-five obtained satisfactory results, thirty-two were improved, five experienced no benefit and fifteen had recurrences. Recurrences following roentgen therapy were due to dietary indiscretions, pregnancy, gastrointestinal disturbances, foci of infection, failure to use astringent preparations for the prescribed periods and sunburn. Roentgen therapy should be preceded by a preparatory course of local therapy for six weeks and if no noticeable improvement occurs roentgen therapy should be instituted. This does not include individuals less than 16 years of age. Temporizing with local measures in recalcitrant cases increases scarring.

Histaminase for Allergic Manifestations.—Forman reports his results with the use of histaminase in the treatment of various allergic manifestations. Enteric coated capsules of histaminase each containing five units of the neutralizing substance were given orally. He finds that histaminase offers a helpful approach to the treatment of urticaria, angioneurotic edema, atopic dermatitis and acute allergic coryza. His results in asthma, contact dermatitis and other allergic conditions were much less satisfactory. It is quite possible that this is a matter of dosage. There were no side effects. Histamine injections and histaminase by mouth are interchangeable in the treatment of allergic manifestations in the skin. In most instances the capsules (one tablet two or three times a day until symptoms disappear) will be more convenient. This preliminary study will have to be extended before conclusions can be reached but the outlook seems most hopeful.

Philippine Islands Med. Association Journal, Manila

19: 653-726 (Nov.) 1939

- Twenty Thousand Cases of Appendicitis. J. J. Estrada and S. C. Meñez, Manila.—p. 653.
Comparative Analysis of Different Brands of Imported Canned Milk. P. I. de Jesus and R. Lim, Manila.—p. 667.
Influence of Altitude and External Temperature on Blood Pressure. F. T. Roque, Baguio.—p. 677.
Autohemotherapy in Glaucoma. V. Delfin, Manila.—p. 683.

Public Health Reports, Washington, D. C.

54: 2239-2268 (Dec. 22) 1939

- Relation Between Trypanocidal and Spirocheticidal Activities of Neosphenamine: V. Spirocheticidal Activity of Several American Brands of Neosphenamine. T. F. Proby.—p. 2242.
Hemorrhagic Adrenal Necrosis in Rats on Deficient Diets. F. S. Daft and W. H. Sebrell.—p. 2247.
Hemorrhagic Cortical Necrosis of Adrenals in Rats on Deficient Diets. A. A. Nelson.—p. 2250.

54: 2269-2334 (Dec. 29) 1939

- *Trends, Geographic and Racial Distribution of Mortality from Heart Disease Among Persons 5 to 24 Years of Age in the United States During Recent Years (1922-1936): Preliminary Report. O. F. Hedley.—p. 2271.
Chloropicrin as Prewarning Gas in Ship Fumigation. G. C. Sherrard.—p. 2297.
Successful Transfer of Lansing Strain of Poliomyelitis Virus from Cotton Rat to White Mouse. C. Armstrong.—p. 2302.

Geographic and Racial Mortality from Heart Disease.—Hedley bases his report on information abstracted from the official mortality statistics issued annually by the United States Bureau of the Census. A downward trend in heart disease mortality among young persons has been noted by several writers. This is corroborated by the author, as he found that death rates from heart disease among persons from 5 to 24 years of age in every section of the country and in every state of the Union in which statistics were obtained showed a decline in the mean annual death rate in 1930-1936 as compared with 1922-1929. The highest mean annual death rates from heart disease among persons from 5 to 24 years of age during 1922-1936 were encountered in the Middle Atlantic states, where the rates were higher than in New England, long supposed to have the highest incidence of rheumatic heart disease. The Mountain and the East North Central states too have a higher reported mortality from heart disease during the age period under study than New England. The Pacific Coast, South Atlantic, West North Central, East South Central and West South Central states follow New England in the order mentioned. Utah, New York, New Jersey, Colorado, the District of Columbia, Pennsylvania, Illinois and Massachusetts had the highest rates, in the order listed. All these states had death rates from heart disease of more than 20 per hundred thousand of population among persons of the ages under consideration during the fifteen year period studied. Mortality from heart disease has continued to decline during the recent economic depression. The death rates from heart disease are higher among Negroes from 5 to 24 years of age in every state and nearly every city in which tabulation according to race is made. This applies to the cities of the North as well as to the cities and states of the South. It indicates a higher mortality rate from rheumatic heart disease among young Negroes. Death rates from heart disease were appreciably lower among white persons of this age group in the deep South than for both races in the Middle Atlantic and New England regions (mostly white) and among the white popula-

tions of most Southern as compared with Northern cities. Rates in cities with more than 100,000 population tended to be significantly higher than in the states and geographic sections in which they are located. This was especially evident in cities of more than 500,000 population. The need for school surveys of heart disease, especially in the South, is emphasized. Studies should be conducted to determine the reason for this apparent decrease in mortality from rheumatic heart disease among young persons, with the view to accelerating further the decline.

Rhode Island Medical Journal, Providence

23:1-16 (Jan.) 1940

- Anesthesia for the Benefit of the Patient: I. Premedication. A. H. Miller, Providence.—p. 1.
Id.: II. Anesthetic Agents. M. Saklad, Providence.—p. 3.
Id.: III. Methods of Administration. J. A. Hayward, Providence.—p. 6.

Southern Medical Journal, Birmingham, Ala.

33:1-122 (Jan.) 1940. Partial Index

- Medicine as a Profession: Some Outstanding Obligations. W. E. Vest, Huntington, W. Va.—p. 1.
Diagnosis and Treatment of Heart Wounds: Summary of Twenty-Five Cases. I. A. Bigger, Richmond, Va.—p. 6.
Clinical Management of Ureteral Stones. W. M. Coppridge, Durham, N. C.—p. 18.
Episcleritis and Interstitial Keratitis from Hypothyroidism. J. B. Stanford, Memphis, Tenn.—p. 27.
Roentgen Therapy to Pituitary Gland in Functional Disturbances of and Associated with Menstruation. J. C. King, Memphis, Tenn.—p. 28.
*Remote Effects of Toxemia of Pregnancy. M. S. Lewis, Nashville, Tenn.—p. 36.
Use of Cyclopropane in Wisconsin General Hospital During the Past Year. H. R. Hathaway, Madison, Wis.—p. 45.
Pneumonia in Infants and Children. C. M. Pounders and F. M. King, Oklahoma City.—p. 58.
Present Status of Endocrine Diseases of Childhood. F. B. Talbot, Boston.—p. 63.
Present Status of the Tuberculosis Situation in the Southern States. P. H. Ringer, Asheville, N. C.—p. 68.
Mortality in Psychotic Illness: Statistical Study of the Georgia State Hospital Since the Beginning of the Pellagra Research Program of the United States Public Health Service in 1914. H. D. Allen Jr., Milledgeville, Ga.—p. 73.
Program for Control of Syphilis. G. F. McGinnes and H. Packer, Memphis, Tenn.—p. 78.
Sulfamethylthiazol: Report of Its Clinical Use in Staphylococcal Septicemia with Apparent Success: Report of Animal Experiments. G. Carroll, L. Kappel, L. Jones, F. W. Gallagher and F. W. DiRocco, St. Louis.—p. 83.

Remote Effects of Toxemia of Pregnancy.—Lewis followed for from one to twelve years seventy cases of non-convulsive and thirty-seven cases of convulsive toxemia in subsequent gestations. Of the seventy cases in the nonconvulsive series recurrent toxemia developed in forty-three, eighteen showed no ill effects following the toxemia and permanent vascular renal disease developed in nine. Of the thirty-seven cases in the convulsive series recurrent toxemia developed in eighteen, fifteen showed no ill effects following the toxemia and permanent vascular renal disease developed in four. The duration and severity of the toxemia before the birth of the child seems to be an important factor in the development of permanent vascular renal disease. The age, parity and the degree of hypertension may be of equal importance. However, these factors play a minor part in the convulsive group. Recurrent toxemia may appear in the absence of any detectable sign of renal impairment. The prognosis seems to be more favorable in the convulsive group if the patient survives the initial toxemia. If all patients who have had late toxemia of pregnancy would report for antepartum care as soon as pregnancy is suspected, the incidence of eclampsia would be greatly reduced and the mild forms of toxemia would be discovered and dealt with earlier. A precise knowledge of the time and mode of onset of a toxemia would be helpful in evaluating the danger of continuing the pregnancy. In this way cardiovascular renal disease would not develop in many women at an early age and it would probably be postponed for many years. Antepartum care is imperative if the major risks are to be avoided, especially as the rapid recovery which usually follows one attack gives the patient a false sense of security. The author believes that no woman should be exposed to further risk if she has had two or more toxic pregnancies. Contraceptive advice should be given, as the risks of future recurrence increases with each succeeding pregnancy.

Southwestern Medicine, El Paso, Texas

23:391-424 (Dec.) 1939

- Lengthening of Life. H. Randolph, Phoenix, Ariz.—p. 391.
Management of Anemias. P. Corr, Riverside, Calif.—p. 394.
Physiologic Biliary Flush in Management of Biliary Tract Disease. R. R. Best, Omaha.—p. 396.
Multiple Sclerosis. L. R. Kober, Phoenix, Ariz.—p. 399.
Anesthetic Procedures for Upper Abdominal Surgery. C. F. McCuskey and L. D. Lee, Glendale, Calif.—p. 401.
Unusual Vertebral Anomaly. H. E. Hipps, Marlin, Texas.—p. 404.
Severe Fractures of Shaft of Tibia (Description of Method of Reduction). M. G. Rosenbaum, Albuquerque, N. M.—p. 405.

Surgery, Gynecology and Obstetrics, Chicago

70:1-128 (Jan.) 1940

- *Treatment of Staphylococcal Septicemia with Bacteriophage. A. B. Longacre, Helen Zaytzeff-Jern and F. L. Meleney, New York.—p. 1.
Surgical and Anatomic Aspects of Case of Double Lower Lip. M. L. Mason, B. J. Anson and L. E. Beaton, Chicago.—p. 12.
Experimental Study of Pain in Human Biliary Tract Induced by Spasm of Sphincter of Oddi. J. A. Layne and G. S. Bergh, Minneapolis.—p. 18.
Secretary Depressant in Achlorhydric Gastric Juice of Patients with Carcinoma of Stomach. A. Brunschwig, T. H. Clarke, J. van Prohaska and R. L. Schmitz, Chicago.—p. 25.
Digital Plethysmograph as Measure of Peripheral Circulation. C. A. Johnson, Chicago.—p. 31.
*Severe Forms of Acute Appendicitis, with Special Reference to Treatment of Appendical Abscess. E. E. Arnheim and H. Neuhoef, New York.—p. 42.
Studies in Blood Preservation: Serum Potassium of Cadaver Blood. J. Scudder, Dorothy R. Corcoran and C. R. Drew, New York.—p. 48.
Hematomas of Umbilical Cord. A. L. Dippel, Baltimore.—p. 51.
Aseptic Gastric Resection: I. Method of Aseptic Anastomosis Adaptable to Any Segment of Alimentary Canal (Esophagus, Stomach, Small or Large Intestine); II. Including Preliminary Description of Subtotal Excision of Acid Secreting Area for Ulcer. O. H. Wangenstein, Minneapolis.—p. 59.
Method of Valvular Cholecystgastrostomy. R. Zollinger, Boston.—p. 71.
Enterogenous Cysts. C. F. Sawyer, Chicago.—p. 78.
Cancer of Breast. I. R. Trimble, Baltimore.—p. 82.
Trauma to Kidney. J. H. Harrison, Boston.—p. 93.
Gas in Bowels: Observations and Experiments in Man. A. Oppenheimer, Beirut, Lebanon, Syria.—p. 105.
Management of Diverticulum of Bladder: Ninety-Six Patients Treated by Transurethral Prostatic Resection. G. J. Thompson, L. H. Kermott and H. Cabot, Rochester, Minn.—p. 115.
Results of Amnesia and Analgesia in 175 Consecutive Cases of Labor. A. T. Lundgren and W. A. Boice, Chicago.—p. 120.

Bacteriophage for Staphylococcal Septicemia.—Longacre and his associates compare the results obtained with bacteriophage in the treatment of thirty-six consecutive cases of *Staphylococcus aureus* septicemia with those obtained in fifty-four not treated with bacteriophage. In their early experiences with bacteriophage the authors used relatively small doses and were not as certain of its potency as they have been more recently. They have therefore divided the cases treated with bacteriophage into two groups: those (fifteen) treated before October 1936 and those (twenty-one) treated for the two years after that date. At this time they not only increased the amounts given but they put their criterion for the potency of the bacteriophage on a much sounder basis. The method for determining the potency of bacteriophage is outlined. The bacteriophages used during the last two years were able not only to clear the culture of the organism in liquid medium but to prevent subsequent growth on a blood agar plate. To this bacteriophage the authors have given the name "double potency phage." The mortality in the early group was 73.3 per cent, in a later group of twenty-one cases it was 28.5 per cent and in the entire group of thirty-six cases it was 47.2 per cent. In the control group of fifty-four cases the mortality was 81.4 per cent. The authors' review of the literature shows the mortality rate of patients with this disease not receiving bacteriophage to be about 80 per cent. The results obtained in this series of cases, especially those in the last two years, make them feel certain that bacteriophage offers a favorable prognosis to patients ill with this disease, if the bacteriophage is of a high potency and if it is given in large doses sufficiently early in the course of the disease.

Acute Appendicitis and Appendical Abscess.—Arnheim and Neuhoef are convinced that death should rarely follow operations for acute phlegmonous or gangrenous appendicitis, appendicitis with local peritonitis or appendicitis with abscess. This view is based on 212 surgical cases in ward service and in private practice from 1931 to 1939. There were four fatal cases, a mortality of 1.8 per cent. Three of the deaths were in cases in which diffuse peritonitis existed at the time of operation. The

fourth death was that of a 73 year old man who had an appendectomy with drainage for acute gangrenous appendicitis. He died on the seventh postoperative day of pneumonia. A post-mortem examination was not performed. The mortality was 0.7 per cent (one death) in 142 cases of acute phlegmonous or gangrenous appendicitis and 23 per cent in the thirteen cases of acute appendicitis with diffuse peritonitis. There were no deaths in forty cases of acute appendicitis with abscess or in seventeen cases of acute appendicitis with local peritonitis. The low mortality (with the exception of that of diffuse peritonitis) is attributed essentially to certain principles in operative technic and in general management before and after operation. Some aspects of diagnosis are stressed, with special reference to abdominal puncture. The choice of time for operation in acutely ill, dehydrated adults is discussed, with emphasis on deferred operation in the presence of proved diffuse peritonitis (proved by abdominal puncture). Avertin with amylene hydrate with the addition of inhalation anesthesia was employed in most cases. Incisions were placed over the known or assumed site of the lesion and were large enough for its complete exposure. Full visualization and isolation of the lesion is a basic feature of the operative technic. In the postoperative management, complicating intra-abdominal suppurative foci are searched for and adequate drainage is provided. Therefore daily (or more frequent) examinations should be made of regions in which complicating abscesses are apt to develop (subphrenic, pelvic, left abdominal). Even when an obvious distant lesion, such as a pneumonitis, may seem to explain the postoperative complication, examination of the abdomen remains an essential step. Reference is made to a study which has shown that suppuration is the most common cause of death after laparotomy for any infective intraperitoneal lesion. Some of the features of the management of appendical abscess which are discussed and on which the results are thought to be based are (1) deferred operation in the early stages of appendical abscess and operation when the acute manifestations have subsided, (2) complete exposure and walling off of the abscess by packs, (3) entry of the abscess through a plane of cleavage, (4) complete evacuation of all recesses of the abscess or abscesses, (5) meticulous technic, (6) removal of the appendix in most instances and (7) drainage of all recesses of the abscessed cavity or cavities by gauze packs and not by tube or rubber dam drains. There were few postoperative complications in the forty cases. A transient fistula to the open stump of the appendix was present in one case. Postoperative incisional hernia did not occur in any of the thirty-one cases followed from one to eight years after operation.

Wisconsin Medical Journal, Madison

39: 1-76 (Jan.) 1940

- Sulfanilamide, Neoprontosil and Sulfapyridine: Their Clinical Application. A. E. Brown, Rochester, Minn.—p. 13.
Injuries of Urinary Tract. C. R. Marquardt and H. E. Cook, Milwaukee.—p. 18.
Some Types of Acute Cervical Cellulitis. S. J. Pearlman, Chicago.—p. 25.
Fibrosarcoma of Optic Nerve: Report of Case. J. W. Tanner and A. J. Hertzog, Eau Claire.—p. 29.
Bleeding Due to Capillary Defect. F. W. Madison and T. L. Squier, Milwaukee.—p. 31.

Yale Journal of Biology and Medicine, New Haven

12: 243-334 (Jan.) 1940

- Adriaan Iseebree Moens (1847-1891). P. Dow, Augusta, Ga.—p. 243.
Planographic Studies of Fourth Ventricle: Preliminary Report with Illustrative Case. O. Turner and W. Lutz, New Haven, Conn.—p. 251.
Chemical Studies on Nature of Susceptibility to Spontaneous Carcinoma of Mammary Gland in Mice. L. C. Strong, New Haven, Conn.—p. 255.
Cellular Reaction to Intraperitoneally Injected Blood. E. L. Sarason, New York.—p. 269.
Biologic Organization and the Cancer Problem. H. S. Burr, New Haven, Conn.—p. 277.
Cellular Reactions to Lipoid Fractions of Tubercle Bacillus: Phthiocerol, an Alcohol Derived from Human and Bovine Tubercle Bacilli. R. M. Thomas, New Haven, Conn.—p. 283.
Studies on Cancerogenic Azo and Related Compounds. R. Kinoshita, Osaka, Japan.—p. 287.
Some Significant Features of Cancer Incidence in Japan. M. Nagayo, Tokyo, Japan, and R. Kinoshita, Osaka, Japan.—p. 301.
Instance of Postesophageal Left Subclavian Artery, Ununited Right Oviduct and Absence of Right Kidney in Same Individual. H. B. Ferris, New Haven, Conn.—p. 305.
Histologic Changes in Rat Testis Following Heat Treatment. W. L. Williams, New Haven, Conn., and B. Cunningham, Durham, N. C.—p. 309.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

62: 341-448 (Dec.) 1939

- Congenital Myotonia in the Goat. G. L. Brown and A. M. Harvey.—p. 341.
Observations on Effects of Trigeminal Denervation. G. F. Rowbotham.—p. 364.
Congenital Facial Diplegia Syndrome: Clinical Features, Pathology and Etiology: Review of Sixty-One Cases. J. L. Henderson.—p. 381.
Dynamics of Homonymous Hemianopias and Preservation of Central Vision. M. B. Bender and M. G. Kanzer.—p. 404.
Blood Changes in Dystrophia Myotonica. J. N. Cumings and O. Maas.—p. 422.
Biochemical Study of Cerebral Tissue and of Changes in Cerebral Edema. A. M. Stewart-Wallace.—p. 426.

British Journal of Radiology, London

12: 649-696 (Dec.) 1939

- *Delineation of Articular Cartilage by X-Rays Without Aid of Contrast Mediums. E. L. Rubin.—p. 649.
Further Experiments with X-Ray Tubes for High Voltages Up to One Million Volts. A. Bouwers and J. H. van der Tuuk.—p. 658.
Lymphosarcoma. F. Roberts.—p. 667.
Fellowship. R. E. Roberts.—p. 674.
Visualization of Nonmetallic Foreign Bodies. R. I. Roberts.—p. 680.
Gamma Ray Measurement of Radon. T. H. Oddie.—p. 686.
Radium Beam Therapy Unit at the Western Infirmary, Glasgow. A. A. Charteris and J. Thomson.—p. 692.

X-Ray Delineation of Articular Cartilage.—A method for the x-ray delineation of articular cartilage without the aid of contrast mediums is described by Rubin. The patient sits or lies on the x-ray table with the outer side of the thigh in contact with a rigid and immobile support placed a few inches above the knee. The knee should be fully extended, the x-ray tube centered above it and a film placed beneath it. The leg is grasped just above the ankle and outward pressure is exerted so as to produce abduction at the knee joint. The pressure should be exerted gradually but firmly, and quite a marked degree of lateral angulation of the knee joint can be produced without the patient experiencing pain. The patient is asked to indicate the point at which the degree of abduction cannot be exceeded without causing him pain. Abduction is not increased after this point has been reached, but the degree of abduction already established is maintained while an antero-posterior roentgenogram of the knee joint is taken. The resulting roentgenogram shows a slight increase in the joint space on the inner side of the knee. But, in addition, the inner part of the true joint space is delineated and appears as a black band of absolute translucency between the articular cartilage of the lower end of the femur and of the upper end of the tibia. It appears white, of course, in the positive print. The articular cartilage of the shoulder and metacarpophalangeal joints are also demonstrable by this method. If there is an effusion in the joint, the outline of the cartilage cannot be visualized. If failure to delineate the cartilage is encountered in a joint in which there is no effusion clinically, it probably indicates that an excess of fluid is nevertheless present in the joint, provided the articular cartilage is successfully delineated in the contralateral joint. Successful delineation of the articular cartilage excludes even a small effusion in the joint.

Indian Medical Gazette, Calcutta

74: 513-590 (Sept.) 1939

- Tuberculosis of Tropical Countries (Primitive Tuberculosis and Partially Modified Disease). S. L. Cummings.—p. 513.
Tuberculosis Survey in a South Indian Town. P. V. Benjamin, M. C. Verghese, K. T. Jesudhan and C. E. Varkkey.—p. 516.
Observations on Some Epidemiologic Factors of Tuberculosis in South India (as Studied from Cases at the Government Tuberculosis Hospital, Madras). K. S. Sanjivi.—p. 527.
Bronchiectasis: Its Etiology, Pathology, Diagnosis, Prognosis and Treatment. A. C. Ukil and K. N. De.—p. 529.
Collapse Therapy of Pulmonary Tuberculosis: Report on Second Series of 205 Thoracoplasty Operations on Ninety-Four Patients from the Wanless Tuberculosis Sanatorium, Wanlesswadi, District Satara. W. M. G. Jones.—p. 537.
Complications During Artificial Pneumothorax Therapy. R. Viswanathan.—p. 543.
Comparative Value of Different Gold Preparations in Treatment of Pulmonary Tuberculosis. Y. G. Shrikhande.—p. 545.
Pneumococcosis, with Special Reference to Silicosis, Anthracosis and Tuberculosis. P. K. Sen.—p. 547.
Tuberculosis of Lymphatic Glands in Neck. M. M. Cruickshank.—p. 554.
Planning of Tuberculosis Institutions in India. C. Frimodt-Møller.—p. 559.

Medical Journal of Australia, Sydney

2: 953-984 (Dec. 30) 1939

Role of Surgery in Treatment of Peptic Ulcer. H. C. Darling.—p. 953.
Mental Conditions Associated with Cardiovascular and Renal Disease.
J. McGeorge.—p. 959.

South African Medical Journal, Cape Town

13: 735-754 (Nov. 11) 1939

Peculiar Form of Renal Tuberculosis. L. Elaut.—p. 737.
Tuberculosis Problem in the Union of South Africa. P. Allan.—p. 740.

13: 755-774 (Nov. 25) 1939

The Health of the Medical Worker. D. P. Marais.—p. 757.
Case of Tuberculosis Caused by Bacillus of Bovine Type in the Union
of South Africa. C. Harington and N. Emmerson.—p. 760.
Brucellosis. E. J. Pullinger.—p. 762.
Progress in Diagnosis and Control of Rabies. A. D. Thomas.—p. 763.
High Blood Pressure (Hyperpiesia). J. F. Haegert.—p. 766.

Chinese Medical Journal, Peiping

56: 303-402 (Oct.) 1939

*Lipoid Granulomatosis of Bones Without Symptoms of Schüller-
Christian's Disease. I. Snapper.—p. 303.
Controlled Spinal Anesthesia with Percaine. J. Gray and E. L. Lee.—
p. 317.
*Blood Vitamin C Content of Chinese in Peiping During the Winter of
1938 to 1939. T. F. Yu.—p. 334.
Ophthalmodynamometric Findings in the Chinese. T. H. Luo and H. L.
Ch'en.—p. 345.
Report on Examination of 587 Normal Dogs in Peiping for Leishmania
Infection: Observations on Experimental Production of Cutaneous
Lesions on Normal Dog Inoculated with Canine Strain of Leishmania.
H. L. Chung, C. W. Wang, C. U. Lee and W. T. Liu.—p. 354.
Establishment of Vagus Postpituitary Reflex: Review. H. C. Chang.
p. 360.

Lipoid Granulomatosis Without Schüller-Christian Disease.—To demonstrate the existence of lipoid granuloma-
tosis without the Schüller-Christian syndrome, Snapper reports
three cases. The syndrome of Schüller-Christian is only one
special—craniopharyngeal—localization of the lipoid granuloma
of the bones. The cases of lipoid granuloma of the bone with-
out craniopharyngeal symptoms are probably more frequent
than the well known cases of Schüller-Christian disease. The
characteristics of lipoid granulomatosis are as follows: 1. Mul-
tiple pseudocystic lesions simulate the lesions of von Reckling-
hausen's disease, sometimes even giving the picture of giant cell
tumor or leading to spontaneous fractures. 2. The lesions of
the skeleton are localized only in the pseudocystic and decalc-
ified areas, the cortex is normal elsewhere and the generalized
fibrous degeneration of the bone as seen in von Recklinghausen's
disease is not present. 3. Tenderness of diseased bones is usually
absent. 4. The biochemical changes characteristic of von Reck-
linghausen's disease are absent. 5. A slight hypercholesteremia
is usually present. 6. Areas of typical xanthoma cells (foam
cells) with double refractile cholesterol esters are found in biopsy
specimens. The biopsy necessary for the diagnosis should be
performed on relatively fresh lesions and not in the most exten-
sive areas which have given rise to the most serious symptoms
and signs, particularly fractures. These lesions are usually old
and the lipoid granuloma has been replaced by fibrous tissue
so that only the terminal stage of the lipoid granuloma simulat-
ing fibrous osteitis can be found. It seems possible that the
disease as described by Albright and his co-workers may also
be lipoid granulomatosis of the bones.

Blood Vitamin C Content of Chinese.—The winter vita-
min C content of the blood of five groups of Chinese was deter-
mined by Yu. The first group consisted of eighty-two members
of the house staff of the hospital and medical students. All of
these were supposed to be on a well balanced diet. A small
quantity of fruit was served only in the morning. Oranges,
lemons, grapefruit and other fruits rich in vitamin C were
served infrequently. On the whole, the vitamin C level of this
group was very low, the average being 0.46 mg. per hundred
cubic centimeters of blood. There were only four persons whose
plasma vitamin C content exceeded 1 mg., all of whom took
several oranges or raw turnips every day throughout the winter.
If these four individuals were considered separately, the plasma
vitamin C level of the rest of this group varied between 0.96
and 0.18 mg. with an average of 0.41 mg. All these house
officers and medical students have fairly healthy gums in spite

of the low plasma vitamin C. The second group consisted of
forty-four inmates of the municipal poorhouse. Their average
plasma vitamin C level was 0.2 mg., with a range between 0.12
and 0.38 mg. per cent. The excessively high food prices pre-
vented the inmates from receiving any fresh vegetables during
the winter. At the time when the plasma vitamin C was deter-
mined, they had been eating green vegetables for one month.
The quantity of vegetables given was, however, relatively small.
Although their plasma vitamin C content was extremely low,
all the inmates considered themselves healthy and were able to
carry on their manual work. On the other hand, practically
all of them showed hypertrophied and bleeding gums as seen
in scurvy patients. They had, however, no spontaneous bleed-
ing elsewhere. The third group consisted of thirty-six hospital
patients suffering from various diseases other than scurvy. The
regular hospital diet did not influence the vitamin C content
of the blood of these patients. Their plasma vitamin C content
remained invariably low throughout. The average was 0.28 mg.
per hundred cubic centimeters, varying between 0.11 and 0.42 mg.
No manifest scurvy was present in any of the group. A fourth
group was formed by seven hospital patients, who in addition
to the ordinary hospital diet received extra vitamin C for several
weeks. Their average plasma vitamin C content was 1.2 mg.
per hundred cubic centimeters, the values ranging between 0.58
and 2.13 mg. The fifth group consisted of ten hospital patients
with clinical signs of scurvy. The plasma vitamin C values of
this group before treatment was instituted ranged from 0.1 to
0.23 mg. per hundred cubic centimeters, the average being
0.16 mg. That the low vitamin C content of the blood in the
Chinese is really due to a lack of vitamin C supply and not to
racial differences receives confirmation from the fact that the
vitamin C level of the blood of Chinese goes up immediately if
its supply is increased.

Tohoku Journal of Experimental Medicine, Sendai

37: 1-188 (Nov.) 1939. Partial Index

Studies on Changes in Intermediary Carbohydrate Metabolism and in
Blood Protein During Respiration in Increased Atmospheric Pressure.
T. Ishikawa.—p. 1.
Arakawa's Reaction and Vitamin C Content of Human Milk. S. Isono.
—p. 33.
Influence of Sodium Bicarbonate on Oxygen Consumption of Retina of
Rabbits in Vitro. N. Oyama.—p. 78.
Biologic Influence of Surgical Treatment on Exophthalmic Goiter and
Thyrotoxicosis. K. Maruta.—p. 88.
Comparative Studies on Cerebral Action Current of Some Mammals.
G. Ito and K. Kitamura.—p. 106.
Modification of Glomerular Filtration and of Tubular Retroresorption by
Infusion of Acacia Solution and Blood Transfusion in Normal and
Cantharidin Rabbits. M. Koiwa.—p. 139.
*Modification of Glomerular Filtration and Tubular Retroresorption by
Injection of Hypnotics and Some Substances of Central Action
(Naphthylamine, Picrotoxin). M. Koiwa.—p. 163.
Behavior of Blood Platelets in Some Surgical Disorders, with Special
Consideration of Renal Tuberculosis. Y. Yabe.—p. 179.

Modification of Renal Function by Hypnotics.—Koiwa
points out that there is still disagreement about the action of
hypnotics on the diuresis and describes his own animal experi-
ments with several hypnotics. He found that if chloral hydrate
is given in small doses it promotes the diuresis, for it slightly
increases the glomerular filtration and the tubular retroresorp-
tion. However, large doses of chloral hydrate as well as of
barbital and phenobarbital produce a noticeable inhibition in
the diuresis by reducing the glomerular filtration. This inhib-
iting action is most noticeable in the case of phenobarbital.
Stimulation of the brain stem by picrotoxin and by naphthyl-
amine results in a reduction of the glomerular filtration;
moreover, by increasing the percentage of retroresorption in
relation to the glomerular filtration the quantity of urine is
decreased. The author thinks that the reduction of the glo-
merular filtration by picrotoxin is due to the central stimula-
tion of the sympathetic and to constriction of the renal vessels.
The fact that the percentage of retroresorption increases in
relation to glomerular filtration is another factor in the
decreased diuresis. Regarding the action of naphthylamine,
the author says that the decrease in the glomerular filtration
and inhibition in the diuresis which follow the injection of
this substance are due primarily to the constriction of the renal
vessels.

Encéphale, Paris

1: 225-274 (May) 1939

- *Metrazol Therapy in Nonschizophrenic Psychoses. P. Delmas-Marsalet, M. Bergouignan and J. Lafon.—p. 225.
 Presenile Dementia: Case. H. Claude and J. Cuel.—p. 243.
 Familial Hypertrophic Neuritis with Pain as Principal Symptom: Case. S. Davidenkof.—p. 261.
 Insulin Therapy, Without and With Metrazol Therapy. Leulier, Leclercq, Casalis and Cappel.—p. 268.

Metrazol Therapy in Nonschizophrenic Psychoses.

Delmas-Marsalet and his collaborators report on the use of metrazol in twenty-one cases of nonschizophrenic psychoses. Therapeutic response ranged from failure and improvement to cure. Best results were achieved in the ten cases classified under the head of mental confusion, with seven cures and three improvements. In five cases, represented by the manic-depressive type of mental disease, failures predominated over improvements and no cure was effected. In three of these five cases with backgrounds of melancholia and hypochondriac depression the potency of metrazol was so intense as to induce maniacal excitation (in one case by a single dose) and necessitate isolation. In the remaining six cases, representing different forms of delirium, one cure and one improvement are recorded. According to the authors, therapeutic modifications were complicated by the presence of previous mental conditions, such as paranoia. The one cure in this group concerned a woman aged 31, a highly nervous and anxious type, whose delirious onset occurred after normal childbirth. Her condition assumed the form of various accusations of infidelity against her husband and of fears of a poison plot against the life of her child and increased to the point of violent manifestations of anger dangerous to others. After two years she was hospitalized. Altogether three injections of metrazol were given. After the second injection she felt well. A normal condition was reported ten months later. The amount and frequency of dosage and the specific manner of administration in the management of these cases are not indicated. On the other hand, therapeutic effects were observed as early as the first injection in a number of cases. Total doses indicated range from two to twenty injections. At the basis of their procedure lies the theory that certain neurologic and mental disorders spring less from cerebral deficiency than from an altered functional condition that can be modified.

Journal de Chirurgie, Paris

54: 593-731 (Dec.) 1939

- *Sprain and Luxation of Knee: Definition and Therapy on Basis of Thirty-Nine Cases. R. Leriche.—p. 593.
 Some Surgical Aspects of Kussmaul-Maier Disease (Periarthritis Nodosa). H. Mondor, R. Ducroquet and C. Olivier.—p. 604.
 Treatment of Fractures of Tarsal Scaphoid. P. Lance.—p. 625.
 Complete Circular Fracture of Cranium Without Functional Disturbances or Cerebromeningeal Lesions. P. Duval and F. Lazard.—p. 643.

Sprain and Luxation of Knee.—Leriche says that the characteristic clinical picture of sprain (edema, local heat, pain and functional incapacity) indicates only functional circulatory phenomena. In observations on thirty-six cases of sprains of the knee and three cases of luxations he emphasizes that there is an essential difference between these lesions. Sprain of the knee is essentially a vasomotor disturbance due to a ligamentous traumatism by forced rotation of the leg against the thigh, most often inside. In its usual type, sprain is without ligamentous laceration and without osseous avulsion. It is cured within a few days by means of anesthetic infiltration of the ligament at the injured and painful points. It is useless to immobilize the member, to make compressive bandages or to massage the part. In some cases the sprain is complicated by ligamentous lesions which involve particularly the cruciate ligaments. They may extend so as to constitute a rupture or an avulsion of the tibial insertion, but an avulsion of a small portion, rarely extensive in volume. The author also has seen chipping of the patellar edge. He never saw, in his thirty-nine interventions, the lesions described as classic on the basis of experimentation on the cadaver, the lesion of Segond and Gangolphe. Regarding the complicated sprains he says that early operation is advantageous in these cases. Luxations of the knee are produced by an entirely different mechanism than are sprains (the body is projected forward while the foot and leg are fixed); they represent luxations of the femur through the tibial collateral ligament. These grave traumatisms produce a veritable dislocation of the knee, which has nothing in common with sprain. It is necessary

to cease confusing the two mechanisms and lesions. They should be strictly differentiated. The luxations of the femur, which are readily reduced because of the enormous ligamentous gap, justify an early operation for repair of the ligamentous damage.

Circular Fracture of Cranium Without Functional Disturbances.—Duval and Lazard report the history of a man, aged 42, thrown from a horse so that the back of his head struck the pavement. He did not lose consciousness and when he arrived at the hospital only a small cutaneous wound was detected in the occipital region. Later he had a mild epistaxis. There were no functional disturbances and the reflexes were normal. After several days the condition of the patient seemed absolutely normal. However, roentgenoscopy of the cranium disclosed a circular fracture, which began in the occipital region at the point of the trauma. It then passed in the lateral and forward directions, traversing the two temporal fossae; its trace was lost in the facial massive; but it seemed to reach the median portion of the orbital fossae and traversed the most anterior portion of the base of the brain, probably at the level of the ethmoid. The discovery of this extraordinary fracture led to a spinal puncture, but the cerebrospinal fluid was found to be entirely normal. The case is noteworthy because the circular cranial fracture caused neither a break in the dura mater nor encephalic changes, which was proved by the absence of clinical disturbances and by the normal condition of the cerebrospinal fluid.

Presse Médicale, Paris

47: 1585-1608 (Dec. 6-9) 1939

- Technic of Peritoneal Drainage in Abdominal Wounds Caused by War Projectiles. J.-L. Faure.—p. 1585.
 Tuberculosis and Ascitic Cirrhosis. J. Monges and R. Poinso.—p. 1586.
 *Treatment of Painful Amputated Stumps with Synthetic Vitamin B₁. A. Sliosberg.—p. 1589.

Treatment of Painful Amputated Stumps with Vitamin B₁.—Sliosberg reports the results of treatment of painful amputated stumps with synthetic vitamin B₁. Treatment consisted of daily subcutaneous injections of vitamin B₁, mostly 0.01 Gm. Of seventy-four patients eleven were completely relieved, thirty-nine showed considerable improvement, ten moderate and seven slight improvement; treatment failed in seven instances. Results included decreasing intensity and frequency of continued and paroxysmal pain and of cutaneous and reflex phenomena. Examination of the stump revealed decreased cyanosis, equalization of cutaneous heat of the opposite sides and in many cases increase of the circumference of the stump from one half to one inch and decrease of arterial hypertension. Study of the rapidity of action of synthetic vitamin B₁ revealed that completely relieved patients reacted mostly after the first and second injection and that the earlier was the response the better were the final results.

Cardiologia, Basel

3: 365-424 (Dec.) 1939

- Nonperiodic Variations in the PR Interval in Man. F. M. Groedel and B. Kisch.—p. 365.
 Relations of Cardiac Action Phases to Frequency of Cardiac Beat. A. Huttmann and A. Eiser.—p. 371.
 Significance of Venous Pressure Registered with Clinical Methods: Relations Between Arterial and Venous Pressures in Normal Conditions of Circulation. V. Scaffidi Jr.—p. 382.
 *Mechanism of Acute Cardiac Pulmonary Edema. S. Wassermann.—p. 402.

Mechanism of Acute Cardiac Pulmonary Edema.—Wassermann reports a case of acute cardiac pulmonary edema in which electrocardiographic records were taken during the attack and during pressure on the carotid sinus, which proved to be therapeutically successful. The electrocardiographic records taken during the attack and during pressure on the carotid sinus do not greatly differ from those made during the interval as regards the rhythm, the beat rate and the conduction; however, the attack electrocardiogram showed a diminution of R₁ and R₂ (perhaps an indication of hypotonia of the cardiac muscle or of insufficiency). This decrease in size in the R wave disappeared when pressure was exerted on the carotid sinus. The success of the pressure on the carotid sinus suggests that the attacks are caused by an insufficiency of the pressoreceptor mechanism. The described case and several similar ones are noteworthy, because the pressure on the carotid sinus produced

only a negligible diminution of the frequency of the pulse (about ten beats a minute); this seems to suggest that pressure on the cardiac sinus during attacks of cardiac pulmonary edema exerts its effects by the vascular reflex rather than by the cardiac reflex. The dyspnea during the attack of pulmonary edema likewise is not regarded as a result of pulmonary stasis but is attributed to pressoreceptor insufficiency. Similarly, the development of alveolar edema is explained not as a sign of mechanical congestion but rather as a sequel of vasopulmonary reflex phenomena, such as vasospasm or vasoparalysis, perhaps increased by capillary permeability. This explains the prompt reversibility of the attacks (spontaneous improvement or by morphine or pressure on the carotid sinus). The pressoreceptor insufficiency may result from (1) anatomic changes in the aorto-carotid region due to sclerosis, syphilis and so on, (2) insufficiency of the left side and the resulting decrease in arterial pressure or (3) a combination of these two factors. The significance of the insufficiency of the greater circulation from the point of view of the pressoreceptor apparatus is discussed.

Schweizerische medizinische Wochenschrift, Basel

69: 1261-1296 (Dec. 16) 1939. Partial Index

- *Iodine in Treatment of Hyperplasia of Thymus. E. Glanzmann.—p. 1261.
- Relations of Liver to Hydrogen Metabolism. H. von Hoesslin.—p. 1265.
- Further Clinical Experiences with Sulfapyridine. W. Löffler and C. Maier.—p. 1268.
- Turpentine Enema. E. Ruppner.—p. 1275.
- Mandelic Acid as Urinary Disinfectant. T. Gordonoff.—p. 1279.
- Remarks on Treatment of Pyoderma. W. Lutz.—p. 1281.
- Treatment of Acne Rosacea. E. Ramel.—p. 1283.
- Meulengracht's Treatment of Bleeding Gastric Ulcer. A. Adler.—p. 1286.
- Modification of Cholesterol Metabolism by Active Principle of Artichoke (Cynara Scolymus) and Use of This Principle (Chophytol) in Therapy of Arteriosclerosis. G. Schönholzer.—p. 1288.

Iodine in Hyperplasia of Thymus.—In this report Glanzmann is interested especially in the occurrence of hyperplasia of the thymus in the newborn with struma. The struma of the newborn may disappear soon after birth, but frequently it recurs in the course of the first year of life. This type of struma is also frequently accompanied by hyperplasia of the thymus, which, however, does not necessarily produce clinical symptoms. The author reviews the history of a nursing aged 11 months who had a large struma and hyperplasia of the thymus. Iodine treatment counteracted the hyperplasia of the thymus. The author treated a number of cases of mild hyperplasia of the thymus by means of iodine and obtained favorable results. It is possible that the iodine acts by way of the thyroid. This and the close functional relations between thyroid and thymus induced him to use iodine in cases of hyperplasia of the thymus, whether goiter was present or not. He reviews the histories of three nurslings aged 6, 8 and 4½ months in whom hypertrophy of the thymus responded to treatment with iodine. Ointment of potassium iodide (10 per cent) was rubbed daily into the region of the manubrium sterni, but the potassium iodide may be given also in the form of a solution. During the iodine therapy the weight should be controlled and, if there is a loss, the iodine treatment should be stopped.

Giornale di Clinica Medica, Parma

20: 1651-1736 (Dec. 30) 1939. Partial Index

- *New Method for Rapid Diagnosis of Diphtheria. G. Agnetti.—p. 1684.
- Rehberg's Test for Functions of Kidney. C. Seghini and F. Bazzi.—p. 1707.

Rapid Test for Diagnosis of Diphtheria.—Manzullo's sodium tellurite test for rapid diagnosis of diphtheria was described in THE JOURNAL, Sept. 3, 1938, p. 954, and in various Argentine and French medical journals. Agnetti used the test in forty cases in the hospital for infectious diseases at Parma City, obtaining typical positive results in thirty-three cases of diphtheria, atypical positive results in one case of diphtheria, typical negative results in five cases of follicular tonsillitis or Plaut-Vincent's angina and atypical negative results in a case of follicular tonsillitis. Typical positive (or negative) results of the test are clear. Atypical positive results are characterized by the appearance of the black or blackish gray color of the exudates with diffusion of the reaction on the entire pseudo-membrane. Atypical negative results are characterized by the appearance of a pale gray color of the tonsillar follicles. In most of the cases observed by the author the results of the test

agreed with those of the classic laboratory tests. The author concludes that the test is specific for diphtheria and that positive results show the advisability of prompt establishment of serum treatment without waiting for the results of the laboratory tests.

Policlinico, Rome

47: 41-80 (Jan. 15) 1940. Practical Section. Partial Index

- *Parathyroidectomy in Scleroderma. G. Liuzzo.—p. 41.
- Subacute Circumscribed Cortical Osteitis. C. B. Piana.—p. 50.

Parathyroidectomy in Progressive Scleroderma.—Liuzzo resorted to parathyroidectomy in the treatment of progressive scleroderma in two cases in adults. The disease dated back eighteen and three years respectively. The patients suffered from cold hands and cyanotic fingers before the cutaneous lesions developed. Later they suffered from recurrent formation of abscesses at the distal phalanges, with mutilation of the phalanges in the case of longer duration in which the disease was associated with typical Raynaud's disease. Scleroderma of the face and neck developed in both cases secondarily to the cutaneous lesions on the hands. There were moderate hypercalcemia and sympathetic disturbances in both cases. Bilateral parathyroidectomy was performed in the case of longer duration. In the other case the operation was unilateral. The parathyroids were normal on microscopic examination in both cases. The operation was followed by subjective amelioration. The patients reported a feeling of better elasticity of the skin at the involved regions and of improvement of the local circulation. Calcemia did not change in the case of longer duration and slightly diminished in the other one. The satisfactory results were transient. They lasted for about three months. The author concludes that a dysfunction of the parathyroids may be a factor in the pathogenesis of scleroderma but is neither the main nor the only pathogenic factor, and that parathyroidectomy is not justified in the treatment of the disease.

Riforma Medica, Naples

55: 1611-1632 (Nov. 11) 1939

- *Variations of Nitrogen in Blood After Cerebral and Meningeal Hemorrhage. F. Raggi.—p. 1611.
- Appendectomy with Small Incision: Technic. G. Iesu.—p. 1619.

Nitrogen in Blood in Cerebral and Meningeal Hemorrhages.—Raggi followed the behavior of azotemia in thirty-eight cases of cerebral or else meningeal hemorrhage in persons who had normal kidneys and no history of renal disease in the past. The determinations of nitrogen in the blood were made on the day the stroke occurred or two or three days after and then at intervals of three days for three weeks and of one week for one month. The author found that in all cases of cerebral and meningeal hemorrhage the amount of nitrogen in the blood increases within the first few days after the stroke occurs. Azotemia does not exceed figures of 1 mg. of nitrogen for each thousand cubic centimeters of blood and lasts no longer than a week or twelve days in cases of moderate cerebral lesion from hemorrhage. Hyperazotemia varies within 1.2 and 1.6 mg. of nitrogen for each thousand cubic centimeters of blood and lasts for two or three weeks in grave cases which follow an evolution to recovery and within 2 and 3 mg. in acute cases in which there is grave coma, with death three or four days after the stroke. If death occurs within one or two days after the stroke, hyperazotemia does not appear. The author concludes that the variations of azotemia in cerebral and meningeal hemorrhages are of a prognostic value. With the exception of the cases which follow a rapidly fatal evolution, the more acute the cerebral lesion from the hemorrhage the more grave the evolution of the condition and the higher the figures of hyperazotemia.

Revista Españ. de Med. y Cir. de Guerra, Valladolid

3: 231-312 (Oct.) 1939. Partial Index

- Route of Approach to Intraperitoneal Wounds During War. F. Cuadrado.—p. 267.
- *Sulfanilamide in Treatment of Smallpox. S. Pierna.—p. 279.

Sulfanilamide in Smallpox.—Pierna employed sulfanilamide in cases of smallpox in two different epidemics after the war in Spain. The infection was subacute, acute and confluent in the majority of cases and benign in rare cases. Seven cases are reported. In the majority, treatment began in the vesiculopustular stage. He found that early in the treatment the general

condition of the patients improves. During the first forty-eight hours the fever disappears, the inflammation subsides and the halo of the vesicles becomes pale and then disappears. Coincidentally the vesicle stops growing, turns gray, shows umbilication and becomes an attenuated pustule which dries up in four or five days. The character, form, aspect and fetor of the crusts and their attachment to the skin depend on the acuteness and extension of the disease. In all cases, however, the crusts drop off in from four to six days. In subacute and acute cases, dropping off of the crusts leaves more or less pigmented spots which disappear late after convalescence but never scars. In cases of confluent variola, superficial scars remain. In some cases of acute, subacute or confluent evolution a furfuraceous peeling takes place after detachment of the crusts, which can be controlled by application of sterile ointments on the skin. No complications were observed in the cases in which sulfanilamide was used. The author compared the evolution of the disease with that of a group of cases of benign smallpox in which sulfanilamide was not administered. He found that the vesiculopustular evolution, desiccation and peeling off was accomplished in less than half the time in the sulfanilamide group in comparison to the control group. The scars were deeper and larger in cases in the latter group. The author believes that sulfanilamide attenuates the smallpox virus and that the drug is specific for the treatment of smallpox.

Chirurg, Berlin

11: 737-768 (Nov. 1) 1939. Partial Index

Treatment of Recent Wounds in War and in Peace. E. von Redwitz.—p. 737.

Questions Relating to Amputations. M. zur Verth.—p. 743.

*Multiple Primary Malignant Neoplasms. E. König.—p. 747.

Unusual Fatigue Fractures. H. Mussgnug and N. Jannopoulos.—p. 753.

Multiple Primary Malignant Neoplasms.—According to König, Billroth insisted on the following criteria for the establishment of multiple primary malignant conditions: The tumors must vary microscopically as well as in their origin and each, in the end, must give rise to its own metastases. König considers these criteria too strict and is inclined to accept Siebke's view that the necessary conditions are fulfilled if, on a careful study, it has been shown that the tumors in question were not related to one another. The fact that the number of microscopic varieties of carcinoma is rather small does not exclude the possibility of two independent tumors resembling each other microscopically. The metastases do not always follow the structural pattern of the original neoplasm. Important as the microscopic differentiation is for the decision, one cannot rely entirely on it but must take into consideration the anatomic and clinical characteristics of the tumors as well as their response to the treatment. The localization of the tumors is of the greatest importance. The time elapsing between the appearance of two tumors is of limited value. The localization of the second tumor is an important factor in deciding whether it is a metastasis of the first tumor or an independent growth. The age of the patient does not appear to play any part. The incidence of multiple malignant tumors as given in the various statistics vacillates between 1 and 2 per cent of all malignant conditions. The author had ten among a total of 720 malignant conditions (1.4 per cent). The combination of carcinoma and sarcoma is rare. Jolkwer had collected fifty cases up to 1929, to which the author adds one of his own and one of Kreibitz's. More than two dissimilar primary tumors constitute a rare occurrence. The most frequent combination is that of a skin carcinoma with a carcinoma of some other part. The author had four such cases. The question of primary bilateral carcinoma of the breast has been much debated. The incidence was given as high as 5.29 per cent (Gjankowicz). The criteria here must be even more strict because of the lymph channels running between the two breasts. König points out the difficulty of regarding the tumor appearing in the opposite breast as a single metastasis because the breast is only exceptionally the seat of metastases. He believes therefore that in the presence of bilateral mammary neoplasms developing at different periods, and in the absence of axillary involvement or any other evidence of metastases, the patient remaining well for years after operative removal of the two, one is justified in considering the second tumor as an independent neoplasm rather than a metastasis of the first.

Medizinische Welt, Berlin

13: 1547-1568 (Dec. 9) 1939. Partial Index

Weil's Disease. H. Ruge.—p. 1547.

Meningeal Course of Weil's Disease. A. Dohmen.—p. 1551.

Autohemotherapy with Irradiation. E. Schrt.—p. 1554.

*Thallium, the New Homicide and Suicide Poison. H. Steidle.—p. 1557.

Thallium Poisoning.—Steidle says that a review of cases in which thallium was used with criminal intent indicates that to some extent thallium seems to have assumed the toxicologic role of arsenic. After one or two days there usually develops a polyncuritis with severe muscular and articular pains, which are localized chiefly in the soles of the feet, the calves of the legs and the knee joints. The patient complains of a furry feeling, formication and hypersensitivity to touch. During the third or fourth week loss of hair sets in, which may lead to complete baldness. Loss of hair in connection with the pains in the legs may be regarded as the characteristic sign of thallium poisoning. General weakness and loss of weight are frequent. The onset of thallium poisoning is sometimes accompanied by vomiting, diarrhea and intestinal colics, which are later followed by constipation. Tachycardia is frequent. The blood picture usually presents an increase in eosinophils, particularly lymphocytes. The urine may contain protein, granulated casts and erythrocytes. The finger nails may show transverse streaks similar to those occurring in arsenic poisoning. Impairment of vision and even complete blindness has been known to occur. Excitation and prolonged insomnia are also frequent. He reviews two cases. In obscure forensic cases it should be a rule to search not only for arsenic but also for the thallium. Thallium can be found in the urine for weeks or months. In the body it is found not only in the blood but especially in the liver, the kidneys and the skeletal musculature. In cadavers it can be detected after years. Among the methods of demonstration, the author regards the spectroscopic one as of greatest importance. It permits the detection of thallium salts if they amount to only 1 part in 100,000. If one drop of such a solution, which contains from 0.02 to 0.03 microgram of thallium, is evaporated in a platinum loop and is then brought into the non-luminant flame, the characteristic light green line can be seen at 5,350.48. The author recommends the spectral analytic method of Bohnenkamp and van Calker for quantitative determinations in forensic cases.

Münchener medizinische Wochenschrift, Munich

86: 1659-1686 (Nov. 24) 1939. Partial Index

Differential Diagnosis of Acute Inflammations of Uterine Tubes and of Vermiform Appendix. W. Geithövel.—p. 1662.

*Pathogenesis of Cushing's Syndrome. J. Jacobi and F. Tigges.—p. 1665.

Significance of Diagnosis in Psychotherapy. W. Hilger.—p. 1668.

Experiences with Dolantin (1-Methyl-4-Phenylpiperidine-4-Carboxylic Acid-Ethylester), a Spasmodic with Myotropic and Neurotropic Action. E. F. Klein.—p. 1674.

Pathogenesis of Cushing's Syndrome.—Jacobi and Tigges say that Cushing designated the syndrome named "pituitary basophilism" because in eleven of fourteen cases he observed a basophilic adenoma of the anterior pituitary which he regarded as the cause of the disease. This opinion has been challenged, but before they explain their own stand on this problem they report two cases of Cushing's syndrome. The first case was characterized by an increase in the corticotrophic hormone, by hypertrichosis and by hyperphosphatemia from organic phosphorus. In the second case the corticotrophic hormone was likewise increased but there was no hypertrichosis and the hyperphosphatemia was due to an increase in lipid phosphorus. It is noteworthy that in the first case the necropsy failed to disclose an adenoma of the hypophysis but did reveal a hypertrophy of the adrenals with circumscribed adenomas in the cortex. The authors review the leading opinions regarding the pathogenesis of Cushing's syndrome and show that these raise the following questions: Are Cushing's syndrome and interrenalism identical? Is the basophilism primary or secondary? Is the hyperplasia of the adrenal cortex primary or is it the result of an increase in the interrenotropic (corticotrophic hormone of hypophysis) hormone? Can Cushing's syndrome develop without increase in the interrenotropic hormone? The authors assume that the majority of cases of Cushing's syndrome are caused by a functional disturbance in the anterior pituitary with an increase in

the interrenotropic hormone. This excess in interrenotropic hormone leads to an increase in the hormone of the adrenal cortex usually with simultaneous hyperplasia of the cortex and thus to Cushing's syndrome. Less often, when there is no increase in the interrenotropic hormone, the development of Cushing's syndrome is presumably the result of a primary hyperfunction of the adrenal cortex (tumors of the adrenal cortex). The significance of basophilism is still obscure because it has been absent in cases of Cushing's syndrome in which there existed an increase in the corticotropic hormone. Only a careful search for the corticotropic hormone and a comparison with histologic changes will further promote the clarification of the pathogenesis of Cushing's syndrome. Clinical methods will reveal the hormone, not, however, the anatomic changes in the pituitary or the adrenals. The aforementioned explanation of the pathogenesis has therapeutic significance. In a number of cases of Cushing's syndrome, roentgen irradiation of the pituitary has produced good results. The authors believe that the success or failure of this therapy is chiefly dependent on whether or not the rays are applied to the organ in which the primary process exists; that is, if the primary disorder is in the adrenals, irradiation of the pituitary will give no prospect of cure, though irradiation or surgical treatment of the adrenals would do so.

86: 1715-1742 (Dec. 8) 1939. Partial Index

- Organization and Transport in Sanitary Service During Aerial Warfare. W. Anschütz.—p. 1715.
Bronchial Asthma and Allergy. H. Kämmerer.—p. 1720.
Psychotherapeutic Treatment of Bronchial Asthma. I. H. Schultz.—p. 1723.
*Question of Familial Predisposition for Complications of Otitis Media in Scarlet Fever. A. Gleissner.—p. 1725.
Question of Genesis of Block Formation of Vertebral Column. F. Reif.—p. 1729.
Dry Blood Test for Syphilis: Simplification. E. Zimmermann.—p. 1732.

Familial Predisposition for Otitis Media in Scarlet Fever.—Previous investigations on the possibility of familial predisposition for sequels of scarlet fever having produced contradictory results, Gleissner reports studies of 356 cases of scarlet fever at the city hospital in Görlitz from April 1937 to April 1939. These 356 cases amounted to more than 50 per cent of the cases occurring in the entire district, the total number on record for the period being 672. Of the 356 cases of scarlet fever observed at the hospital, otitis media developed in nineteen (5.3 per cent). Eleven of these nineteen belonged to the group of sixty-one cases of scarlet fever from families in which more than one case of scarlet fever occurred, the eleven cases belonging to seven families. Of the remaining 295 cases of scarlet fever observed at the author's hospital, otitis media developed in only eight, or 2.7 per cent. Inquiries disclosed that of the 296 cases of scarlet fever occurring in the same district but not seen at the author's hospital, otitis media developed in eight. The author deduces from these figures that certain families have a predisposition for otitis media as a sequel of scarlet fever.

Wiener Archiv für innere Medizin, Vienna

33: 145-212 (Nov. 20) 1939

- *Fever Therapy in Chronic Enterocolitis. E. Lauda and G. Stritzko.—p. 145.
Clinical Diagnosis of "Intermediary Liver Engorgement." H. Kahler.—p. 167.
Accompanying Signs of Chronic Gastro-Enteritis. F. Bodart and R. Klima.—p. 178.
Thyroid Gland Studies in Switzerland: Contribution to Endemiology of Goiter. W. Risch.—p. 197.

Fever Therapy in Chronic Enterocolitis.—Lauda and Stritzko report seven cases of chronic enterocolitis in which good results were obtained by means of pyretotherapy. The age of the patients was between 30 and 53. The diseases presented ranged from grave enteritis to ulcerous proctosigmoiditis. In individual cases chronic illness had lasted for from ten to twelve years. Fever therapy consisted of injections of milk, typhus and autogenous vaccines and of blood transfusions. The therapeutic objective of producing high febrility governed the changes from milk to typhus vaccine or from blood transfusion to milk, then to blood transfusion, or from autogenous to typhus vaccine, then to milk and again to typhus vaccine and so on. Almost immediate results could be observed. The seven cases are a part of fifty cases of

chronic enterocolitis pyretotherapeutically managed with good results in half of them. The authors regard fever therapy as contraindicated in septic cases, cachexia and defective circulation. Cases of colitis they found respond better to the treatment than enteritis. Ulcerous colitis, as well as simple enteritis, was benefited.

Zeitschrift für Immunitätsforschung, Jena

97: 1-108 (Nov. 17) 1939

- Complement Content of Human Serum. E. Schuchardt.—p. 1.
Aspects of Antigenic Relations of Shiga Dysentery Bacillus and of Blood Group Substance Zero in Human Subjects. Inge Schmidt-Schleicher.—p. 14.
Significance of Factors M and N for Forensic Medicine with Especial Consideration of Procedures Used for Determination of N. H. Langenberg.—p. 48.
Diagnosis of Brucellosis by Means of Marginal Values of Agglutination Reaction (in Man and Animals). E. Vellisto.—p. 68.
*Vanadium in Treatment of Protozoal Diseases in Human Subjects. J. Pereira.—p. 77.
Influence of Iron, Manganese and Copper on Course of Poisoning with Diphtheria Toxin. H. O. Hetsche.—p. 81.
Histamine and Burns. T. Wense.—p. 100.

Vanadium in Treatment of Protozoal Diseases.—Pereira first describes his experiences with vanadium sodium tartrate in syphilis. The salt, in the form of an aqueous solution (0.15 Gm. in 2 cc.), is injected intramuscularly twice weekly. The spirochetes, which could always be demonstrated in the exudate of the primary lesion, disappeared within twenty-four to forty-eight hours and cicatrization was completed in from three to six days. The secondary lesions of skin and mucous membranes likewise disappeared rapidly. Even gummas that had been refractory to bismuth compounds, arsenic and several series of arsphenamine were rapidly cured. The toxicity of vanadium tartrate is low, being tolerated even by children of less than a year. Stomatitis, erythema and hepatic disorders have been observed in rare instances. Because frambesia resembles syphilis, it was decided to try vanadium therapy also in frambesia. The results were favorable.

Zeitschrift für klinische Medizin, Berlin

136: 715-819 (Nov. 4) 1939. Partial Index

- Value of Calcium and Vitamin C in Nutrition. G. Lemmel.—p. 715.
Frequency and Types of Gastric and Duodenal Ulcers. W. Madelung.—p. 727.
Essential Xanthomatosis. H.-G. Schmidt.—p. 738.
Rheumatic Myocarditis with Special Regard to Electrocardiogram Observations. J. Wolf and D. J. Athanasios.—p. 753.
Alizarin Reaction as Means of Diagnosing Functional Disturbances of Kidneys. R. Teuffl.—p. 775.
*Effect on Circulation of Hypoglycemic Shock Treatment in Schizophrenia. C. Ernst.—p. 797.

Hypoglycemic Shock Treatment in Schizophrenia.—Ernst examined the effect of hypoglycemic shock on the circulation of twenty-four schizophrenic patients between the age of 18 and 42. The examinations were carried out with the question in mind whether shock treatment can cause serious circulatory changes endangering life eventually. Readings of the electrocardiogram, frequency of the pulse, blood pressure, product of amplitude and frequency, circulating blood and plasma quantity were examined before administration of insulin and in deep shock. The changes observed were such as one may see in physical labor. The author found no proof of a lasting injury to the heart muscle.

Zeitschrift f. menschliche Vererbungslehre, Berlin

23: 661-788 (Oct. 26) 1939. Partial Index

- Dementia Paralytica and Senile Dementia: Hereditary, Clinical and Anatomic Considerations. B. Patzig.—p. 661.
*Hereditary Transmission of Congenital Cardiac Anomalies. G. von Knorre.—p. 695.
Facial Changes in Developmental Disturbances and Diseases of Hypophyseal System. K. Klöppner.—p. 721.
Congenital Amputations. R. Günther.—p. 736.

Hereditary Transmission of Congenital Cardiac Anomalies.—Von Knorre began his studies on the hereditary transmission of congenital cardiac defects with fourteen unselected severe cases. As far as possible, studies were made on the siblings, children, parents, uncles, aunts, cousins and grandparents of these patients. In all, 150 persons were examined not only with clinical methods but also with x-rays and, in many instances, electrocardiographic tracings. Case records and postmortem reports were investigated. The author reports

fourteen cases in which, among other defects, pulmonary stenosis, defects in the auricular and ventricular septums, open ductus botalli, congenital tricuspid insufficiency and stenosis of the aortic isthmus were present. He says that, among the persons closely related by blood to patients with severe congenital cardiac defects, mild forms of the same defect were detected repeatedly. These could be explained only in connection with the severe defect of the original patient. Examination with clinical methods disclosed little, but x-ray examination and electrocardiographic studies did reveal defects. The author concludes that extensive familial examinations are advisable in cases of obscure pathologic conditions of the heart.

Zeitschrift für Tuberkulose, Leipzig

84: 1-120 (Dec.) 1939

- *Cure of Cavities by Suction Drainage According to Monaldi. H. Grass.—p. 1.
Suction Drainage for Cure of Tuberculous Cavities in Lungs. H. Weber.—p. 19.
Temporary Shadows in Lungs. G. Martens.—p. 26.
Behavior of Homolateral Pulmonary Lobe After Upper Partial Plastic Operation. A. Emmeler.—p. 40.
To What Extent Do Roentgenologically Demonstrable Calcified Foci Occur in Pulmonary Tuberculosis of Adults? H. Malmros and R. Ardell.—p. 46.
Blood Albumin Colloid Curves in Pulmonary Diseases. B. Dubóczy.—p. 50.

Monaldi's Suction Drainage of Cavities.—Grass directs attention to Monaldi's method of suction drainage in the treatment of tuberculous cavities. In this method the cavities are punctured through the thoracic wall and a thin rubber catheter is introduced through which air and the other contents of the cavity are constantly suctioned off. Monaldi having employed this method with good results in more than 100 cases, Grass decided to try this procedure on his own patients, the more so since it does not greatly tax the reserve powers of the patient and thus can be employed in weak and in old persons. The method is essentially the application of Bühlau's empyema drainage to the tuberculous cavity of the lung, but it is more difficult in some respects. One of the greatest difficulties is the exact localization of the cavity. The position and size of the cavity must be known in order to determine the site, direction and depth of the introduction of the trocar. The author gives a detailed description of the technic. He thinks that the suction drainage is indicated especially for the treatment of cavities for which other procedures are either too dangerous or not suitable. He reports and discusses the six cases in which he employed the method with good success. He stresses the favorable effects on the general condition and says that his results were essentially like those obtained by Monaldi. In a considerable number of Monaldi's cases the treatment has been completed and in none of them did a fistula remain. In at least half of them a complete success was obtained.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

79: 3081-3224 (Dec. 5) 1939. Partial Index

- Epithelial Swellings of Limbus Corneae in Natives of Netherland East Indies. H. Müller.—p. 3082.
Lymphangioma Cysticum of Spleen. W. J. van Ramshorst.—p. 3093.
*Tumors of Thymus. Kouwenaar.—p. 3103.
Complete Transverse Lesion of Spinal Cord by Metastases of Carcinoma. W. Österreicher.—p. 3113.
Clinical Aspects of Renal Tumors. L. W. van Ouwerkerk.—p. 3120.
Disorders of Spinal Cord as Result of Tumors and Other Processes in Vertebral Canal. P. M. van Wulfften Palthe.—p. 3162.
Present Status of Therapy of Carcinoma of Cervix Uteri and Results in Batavia During Years 1931 to 1934. R. Remmelts.—p. 3174.
*Myxomas. R. E. J. ten Seldam.—p. 3191.

Tumors of Thymus.—Kouwenaar calls attention to the different hypotheses about the origin of some elements of the thymus, especially the so-called thymus cells. He cites the theories of substitution and transformation. He thinks that this difference of opinion may perhaps explain also why statistics differ so much as to the frequency of thymic neoplasms. He presents a critical analysis of a number of cases that he observed and classifies them as sarcoma, adenoma, carcinoma and thymoma. His report indicates that because of the great differences in structure the classification is difficult but also that true carcinomas of the thymus are rareties.

Myxomas and Malignancy.—Ten Seldam reviews the literature on myomas and then reviews the myxoma material of the cancer institute of the Netherland East Indies. The latter

comprises forty-two cases, namely fourteen fibromyxomas, twelve pure myxomas, two lipomyxomas, ten myxosarcomas, one lipomyxosarcoma and three chondromyxomas. The study of these cases and of the literature convinced the author that all myxomas are to be regarded as potentially malignant. Since irradiation gives little promise of success, the author thinks that every myxoma, including the recurrences, should be treated surgically and as radically as possible.

Acta Medica Scandinavica, Stockholm

102: 449-661 (Dec. 19) 1939. Partial Index

- Hematologic Changes, Especially Megalocytic Anemia, in Regional Ileitis. P. Plum and E. Warburg.—p. 449.
Experimental Studies on Wenkebach Periods, Block, Prolongation of Auriculoventricular Conduction and Continuous Arrhythmias: Electrocardiography After Administration of Physostigmine, Propetone, Morphine-Scopolamine and Nicotine. E. de Somer.—p. 476.
Determination of Venous Pressure: New Apparatus. W. J. Kolff.—p. 524.
*Pernicious Anemia and Gastric Carcinoma. A. W. F. Jenner.—p. 529.
Significance of Circulation in Pathogenesis of Extrarenal Azotemias. P. Gömöri, L. Podhradzky and J. Kring.—p. 591.
Hemopoiesis and Endogenous Uric Acid. R. Opsahl.—p. 611.
*New Investigations on Elimination of Poliomyelitis Virus in Feces. C. Kling, G. Olin, J. H. Magnusson and S. Gard.—p. 629.
Hereditary Hemorrhagic Diathesis. E. Bruun.—p. 639.
Auto-Inhibition in Wassermann Reaction. B. Olhagen.—p. 654.

Pernicious Anemia and Gastric Carcinoma.—A review of the literature regarding the connection between pernicious anemia and gastric carcinoma revealed to Jenner that the opinions of investigators are divided. He studied the fate of 181 patients with pernicious anemia and found gastric carcinoma in eight; but only seven of these can be considered in connection with the subsequent statistical studies. To affirm the relationship between pernicious anemia and gastric carcinoma, it must be demonstrated that the incidence of gastric carcinoma is greater among patients with pernicious anemia than among persons without this disease who belong to the same age groups as do the patients with pernicious anemia. The author made statistical studies, which revealed that the expectancy of gastric cancer among 181 patients would have been less than 0.3. It is important also to determine whether the incidence of gastric carcinoma among the patients with pernicious anemia is still within the limits of accidental occurrence. Accepted tables for statisticians and biometricians indicate that the occurrence of three or more cases of gastric cancer would noticeably exceed the limits of accident. The seven cases thus cannot be ascribed to accident, but a factor must be involved which is responsible for this high incidence. The author reaches the conclusion that the frequent occurrence of gastric cancer in cases of pernicious anemia is due to chronic gastritis, a condition nearly always present in cases of pernicious anemia. Chronic gastritis is the connecting link between the two processes. The author concludes that patients with pernicious anemia should be kept under observation for the possible development of gastric cancer. Carcinomas other than gastric ones do not have a higher incidence in anemic patients.

New Determination of Poliomyelitis Virus in Feces.—Kling and his associates point out that, whereas until recently it was necessary to resort to filtration through candles (Chamberland, Berkefeld and others) to demonstrate the virus of poliomyelitis in fecal matter, Trask, Vignec and Paul seem to have made an advance by substituting for filtration purification by means of volatile antiseptics such as ether or acetone. The authors describe their experiences with this method. In a subject presenting atypical symptoms of poliomyelitis (normal reflexes and absence of paralysis and of disturbances in sensitivity) the new method revealed poliomyelitis virus sufficiently virulent to provoke in monkeys typical experimental poliomyelitis. However, the method has been used in only a small material. It is impossible to give a definite evaluation as yet. The author tested specimens of the same feces after different intervals of storage. A table indicating the results of four different tests reveals that only the portion conserved for twelve hours produced a positive result, whereas the specimens conserved for fifty-three, 152 and 190 hours gave negative results. The authors are unable to say whether the virulence of the poliomyelitis virus is destroyed by the contact with the volatile antiseptic (ether) or by substances in the feces.

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STUDIES ON THE MECHANISM OF THE ACTION OF SULFANILAMIDE

IV. THE INFLUENCE OF PROTEOLYTIC PRODUCTS ON THE EFFECTIVENESS OF SULFANILAMIDE

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AND

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PHILADELPHIA

Progress in the synthesis of effective chemotherapeutic agents must await a more thorough understanding of the essential mechanism by which sulfanilamide and related compounds produce their effects on bacteria and the lesions associated with infection.

It was because of this that we began three years ago to study certain of the fundamental factors governing the mode of action of sulfanilamide. The data have been obtained from clinical and experimental investigations, since we believe that the problem can be satisfactorily approached only by a concerted and coordinated study carried on by the same group.

An important conclusion reached during a study of 250 cases of human hemolytic streptococcus infections¹ was the fact that sulfanilamide produced its most important effects on diffuse lesions characterized by maximal tissue invasion and minimal tissue destruction. Subsequent investigations have impressed on us the importance of proteolytic products as a rich source of the substances which bacteria may readily utilize in maintaining their biologic activity. These products of protein hydrolysis have been shown by Bradley² to consist of proteoses, peptones, polypeptides and amino acids.

Experiments concerned with the effect of sulfanilamide on experimental hemolytic streptococcus meningitis in the albino rat³ confirmed the clinical observations we had previously made that the drug attacked primarily the invasive component of the infection; in other words, the drug destroyed the bacteria which were multiplying in tissues which were relatively unaltered.

We later reported experiments⁴ in which we were able to confirm the observations of Colebrook and other

workers⁵ on the ability of sulfanilamide in whole human blood to destroy limited numbers of hemolytic streptococci. We observed, however, that phagocytosis was secondary to the humoral effects of the drug. The evidence for this observation, which was not in agreement with that reported by other investigators, strongly indicated that cell-free serum containing sulfanilamide was as bacteriostatic for hemolytic streptococci as whole blood from the same donor. In the course of these studies we recognized the profound importance for bacterial growth in serum of minute amounts of peptone which had been carried over with the bacterial inoculum.

The observations that amounts of peptone as small as 0.01 mg. per cubic centimeter of culture medium had a definite effect on the population curve, with or without sulfanilamide, emphasized the practical inaccuracy of most of the experimental work on the bactericidal action of blood and serum. It was apparent that normal human serum, even without sulfanilamide, was not a favorable culture medium for the multiplication of even markedly invasive strains of hemolytic streptococci. On the other hand, the addition of peptone rendered the serum favorable for the propagation of even relatively noninvasive strains of this organism. The effect of sulfanilamide in vitro was only maximal when even small traces of peptone were excluded from the serum. It seemed highly likely that under these circumstances the serum medium was deficient in the readily assimilable nitrogen necessary for biologic activity.

Our data led us to propose as a tentative hypothesis that sulfanilamide interfered with the ability of hemolytic streptococci to utilize protein-split products in serum and that the presence of peptone provided assimilable nitrogen in such excess that sulfanilamide could no longer act with optimal effectiveness. The precise mechanism by which peptone interferes with the action of sulfanilamide is, we believe, necessary for any fundamental understanding of the action of sulfanilamide in vivo.

It must be shown that this same phenomenon accounts for the action of sulfanilamide in other mediums and on other types of bacteria. Moreover, such an explanation, if valid, should apply equally to the action of sulfapyridine. In the present paper we present further data on the role of peptone in influencing the action of sulfanilamide on hemolytic streptococci in

From the Laboratory of Surgical Bacteriology, Harrison Department of Surgical Research, University of Pennsylvania School of Medicine.

1. Lockwood, J. S.; Coburn, A. F., and Stokinger, H. E.: Studies on the Mechanism of the Action of Sulfanilamide: I. The Bearing of the Character of the Lesion on the Effectiveness of the Drug, *J. A. M. A.* **111**: 2259 (Dec. 17) 1937.

2. Bradley, H. C.: Autolysis and Atrophy, *Physiol. Rev.* **2**: 415 (July) 1922.

3. Adolph, P. E., and Lockwood, J. S.: Studies in the Mechanism of the Action of Sulfanilamide: II. Sulfanilamide in the Treatment of Experimental Streptococcal Meningitis, *Arch. Otolaryng.* **27**: 535 (May) 1938.

4. Lockwood, J. S.: Studies on the Mechanism of the Action of Sulfanilamide: III. The Effect of Sulfanilamide in Serum and Blood on Hemolytic Streptococci in Vitro, *J. Immunol.* **35**: 155 (Sept.) 1938.

5. Colebrook, Leonard; Buttle, G. A. H., and O'Meara, R. A. G.: The Mode of Action of p-Aminobenzenesulfonamide and Penicillin on Hemolytic Streptococcal Infections, *Lancet* **2**: 1323 (Dec. 5) 1936. Gay, F. P., and Clark, Ada R.: On the Mode of Action of Sulfanilamide in Experimental Streptococcus Empyema, *J. Exper. Med.* **66**: 525 (Nov.) 1937. Long, P. H., and Bliss, Eleanor A.: Para-Amino Benzenesulfonamide and Its Derivatives: Experimental and Clinical Observations on Their Use in the Treatment of Beta-Hemolytic Streptococcus Infection, *J. A. M. A.* **108**: 32 (Jan. 2) 1937. Bliss, Eleanor, A., and Long, P. H.: Observations on the Mode of Action of Sulfanilamide, *ibid.* **109**: 1524 (Nov. 6) 1937.

human serum and show that the same general principles apply in the action of sulfanilamide on *Bacillus coli* in urine (therapy accounting for Mellon's⁶ phenomenon of "potentiation") and in the action of sulfanilamide on pneumococci and staphylococci in human serum. Furthermore, evidence will be presented to show that peptone has a definite inhibiting effect on the action of sulfapyridine on hemolytic streptococci and, to a much smaller extent, on pneumococci.

TECHNIC

Full technical details have been previously published.⁴ Briefly, the technic employed in all these experiments was as follows: Fresh serum was obtained from freshly

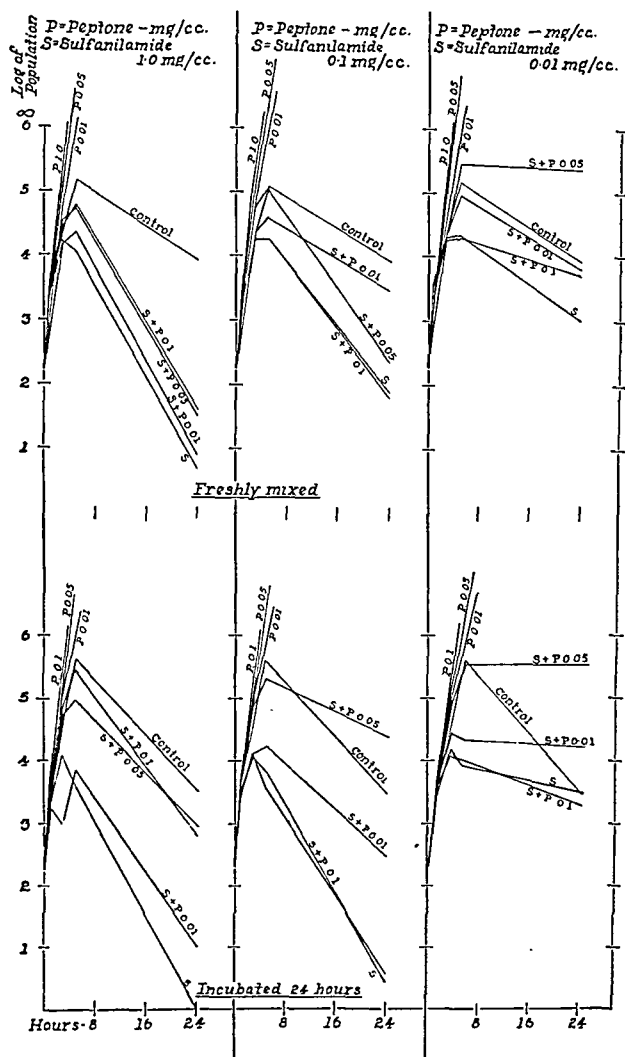


Fig. 1.—Inhibiting effects of varying amounts of peptone on the action of varying concentrations of sulfanilamide (experiment 129).

drawn human blood defibrinated with glass beads. One cc. of serum was placed in each of the required number of small test tubes. We obtained organisms by inoculating 5 per cent horse serum-neopeptone water from stock, incubating it overnight and transferring 0.1 cc. to 4 cc. of 20 per cent horse serum-neopeptone water for a final two hours of incubation. This provided us with an inoculum of young, encapsulated organisms in a logarithmic phase of multiplication. This inoculum was obtained by centrifuging the two hour culture and

resuspending the bacterial sediment in serum. The desired dilutions of culture were then made in serum. This procedure resulted in the exclusion of essentially all the horse serum and peptone from the original medium.

Solutions of sulfanilamide and sulfapyridine were freshly prepared for each experiment by adding the required amount to physiologic solution of sodium chloride and bringing it to a boil. The routine peptone solution was made from neopeptone (Difco) but in some control experiments the solutions were made with other types of peptone. The results were essentially the same. The reagents were added to the tubes of serum with a calibrated micropipet, and in all cases the total quantities of water and sodium chloride were accurately controlled.

As a rule the ratio of added reagents to serum was of the order of 1 to 10 by volume. The tubes were sealed with wood corks dipped in paraffin and mounted on a slowly rotating drum in the incubator. At the desired intervals the tubes were removed and opened and 0.1 cc. was explanted to 1 cc. of neopeptone water in a Petri dish. Ten cc. of horse blood or horse serum agar was added and mixing was obtained in the usual manner. Plates were read after forty-eight hours, the low power objective of the microscope being used whenever necessary. The figure obtained for an average of a number of fields was multiplied by 3,000 in order to achieve the final estimate of population. In all the figures here presented the determinations are based on the logarithm of the population of the 0.1 cc. explant and do not represent any absolute values for bacterial population. It is obvious that any technic of this sort involves fairly wide variations from experimental error. But in view of the fact that the curves are reduced to gross logarithmic representation the experimental error is insignificant.

INHIBITING EFFECTS OF VARYING AMOUNTS OF PEPTONE ON THE ACTION OF VARYING CONCENTRATIONS OF SULFANILAMIDE

Chart 1 shows the population curves obtained with different concentrations of sulfanilamide balanced against different concentrations of peptone. In the upper group peptone and sulfanilamide were added to the test serum immediately after being mixed. In the lower group the sulfanilamide and peptone were incubated together for twenty-four hours before the organisms were added and incubation was started. It was hoped thus to disclose any possible role that might be played by the time factor required for a possible linkage or chemical union between sulfanilamide and peptone.

The following points deserve especial mention:

1. The population curve is raised by decreasing the concentration of sulfanilamide and lowered by decreasing the concentration of peptone. The population curves tend in general to arrange themselves in logical sequence. However, some variations are present, the most conspicuous being the positions of the curves resulting from the addition of 0.1 mg. of peptone per cubic centimeter. The occasional variation from the expected sequence is not unusual in experiments of this type. They are the result of the inherent error of the method.

2. The addition of peptone to sulfanilamide-free control serums produces a marked increase in the rapidity of outgrowth.

6. Mellon, R. R.; Gross, Paul, and Cooper, F. B.: Sulfanilamide Therapy of Bacterial Infections with Special Reference to Diseases Caused by Hemolytic Streptococci, Pneumococci, Meningococci and Gonococci, Springfield, Ill., C. C. Thomas, Publisher, 1938.

3. It is possible through the use of a hundred times as much sulfanilamide as peptone to produce bacteriostasis of an order similar to that obtained in peptone-free serum containing sulfanilamide, even though this small quantity of peptone has a markedly stimulating action on the growth of streptococci in sulfanilamide-free serum (chart 1, upper left corner).

4. There are no significant differences between the groups in which peptone and sulfanilamide were freshly mixed and those in which these substances were incubated for twenty-four hours.

EFFECT OF SULFANILAMIDE ON *BACILLUS COLI* IN URINE

Mellon and his associates⁶ have reported data from experiments on the action of sulfanilamide on *Bacillus coli* in urine. They observed that colon bacilli grown in urine and added, after dilution in urine, to urine containing sulfanilamide were markedly restricted in their growth. If, however, they were diluted in broth

The Effect of Sulfanilamide on Bacillus Coli in Urine (Experiment 112; Mellon's Phenomena of "Potentiation" Explained by Peptone Content)

Culture Medium	Diluent	Test Medium	Concentration of sulfanilamide, Mg./Cc.	Concentration of peptone, Mg./Cc.	Population of 0.1 Cc. at			
					Start	6 Hrs.	24 Hrs.	72 Hrs.
Urine	Urine	Urine	0	0	25	36,000	∞	∞
Urine	Urine	Urine	0.1	0	22	3,000	8	35
Urine	Urine	Urine	0	20	33	108,000	∞	∞
Urine	Urine	Urine	0.1	20	36	36,000	∞	∞
Broth	Urine	Urine	0	0	11	21,000	∞	∞
Broth	Urine	Urine	0.1	? adsorbed	15	480	536	∞
Broth	Broth	Urine	0	0.1	22	12,000	∞	∞
Broth	Broth	Urine	0.1	0.1	6	400	27,000	∞
Broth	Broth	Urine	0	1.0	13	15,000	∞	∞
Broth	Broth	Urine	0.1	1.0	11	3,000	∞	∞

before being added to the sulfanilamide test urine the inhibition of growth did not take place. In order to account for these variations, Mellon advanced the theory of "potentiation."

According to this concept the organisms were acted on during their phase of growth in urine in such a way as to be rendered susceptible to the action of sulfanilamide in the test urine and in such a way that the "potentiation" of two effects was necessary in order to achieve bacteriostasis of colon bacilli in vitro with sulfanilamide.

The data of Mellon and his associates constitute, we believe, an important confirmation of the theory of protein-split products as inhibitors of the action of sulfanilamide. We have repeated Mellon's experiments, using his own technic. The results are shown in the accompanying table. In the first pair the organisms were grown in urine, diluted in urine and tested in urine with and without sulfanilamide. Of course, no added peptone was present. Under these conditions active growth appeared in the control and marked inhibition, just short of sterilization, took place with sulfanilamide in a concentration of 10 mg. per hundred cubic centimeters.

In the second pair the organisms were prepared in identical fashion except for the addition of a quantity of peptone, so that the final concentration was approximately 20 mg. per cubic centimeter. With the addition of peptone constituting the only difference, no inhibition by sulfanilamide occurred.

In the third pair the organisms were grown in broth, were diluted in urine so as to exclude all except possible traces of adsorbed peptone and were then added to urine with and without sulfanilamide. Under these conditions a definite bacteriostasis took place during the first twenty-four hours, indicating conditions closely resembling those in the first pair; final outgrowth in forty-eight hours did, however, take place.

In the fourth pair the organisms were grown in broth, diluted in broth and added to urine with and without sulfanilamide, after preliminary centrifugation of the broth suspension of diluted bacteria and resuspension of the bacteria in urine. This excluded all the culture medium except for one drop left at the bottom of the centrifuge tube with the bacterial residue. With this preparation there was carried over about 0.1 mg. of peptone per cubic centimeter. Some bacteriostasis resulted.

In the last pair the centrifugation and resuspension were omitted and the result was complete elimination of any inhibition of the bacteriostatic action of sulfanilamide, offering a striking contrast to the preceding experiments.

We believe that Mellon is correct in pointing out that normal urine is not a highly favorable culture medium for *Bacillus coli*. However, it becomes a highly favorable medium if small amounts of peptone or of products of tissue breakdown are present, either in the test tube or in the body. Ballenger and his associates⁷ have recently confirmed the observation that conditions in the urinary tract which might lead to an increased production of products of tissue breakdown may account for failures of sulfanilamide therapy.

In view of the increasing attention which is being paid to the possible action of sulfanilamide as an antiscatalase, it is of interest to call attention to the fact that *Bacillus coli* is generally considered to be highly resistant to the lethal effects of hydrogen peroxide. We merely wish to raise the question whether the latter theory of sulfanilamide action is adequate to explain the action of sulfanilamide on *Bacillus coli* in urine.

EFFECT OF SULFANILAMIDE ON *STAPHYLOCOCCUS AUREUS*: INHIBITING ACTION OF PEPTONE

It has been generally agreed that sulfanilamide possesses little effectiveness in vitro against staphylococci. It is important to point out, however, that the failure to recognize such an effect in in vitro experiments has been due largely to the neglect of the importance of the traces of peptone which would ordinarily be present in mediums in the experiments that have been made. Chart 2 shows the population curves resulting from the inoculation of small numbers of staphylococci into human serum containing varying amounts of sulfanilamide and peptone. The curve to the left indicates that complete inhibition of growth may occur during the first twenty-four hours of incubation if peptone is entirely excluded from the mediums. The presence of as little as from 0.01 to 0.1 mg. of peptone to a large extent overcomes the bacteriostatic effect of even 1 mg. per cubic centimeter (1:1,000) of sulfanilamide. The middle curve shows that sulfanilamide in concentrations of 0.1 mg. per cubic centimeter (1:10,000) is almost completely ineffective in restraining the outgrowth of the same inoculum of staphylococci. The curves at the

7. Ballenger, E. G.; Elder, O. F.; McDonald, H. P., and Coleman, R. C.: Failures in the Treatment of Urinary Tract Infections with Sulfanilamide, *J. A. M. A.* 112:1569 (April 22) 1919.

right in chart 2 compare the efficacy of sulfapyridine and sulfanilamide in concentrations of 0.1 mg. per cubic centimeter (1:10,000).

In these data sulfapyridine is definitely more effective than sulfanilamide in limiting the outgrowth of staphylococci after the first three hours and is slightly more effective in overcoming the growth stimulating effects of peptone. It is our opinion that the failure

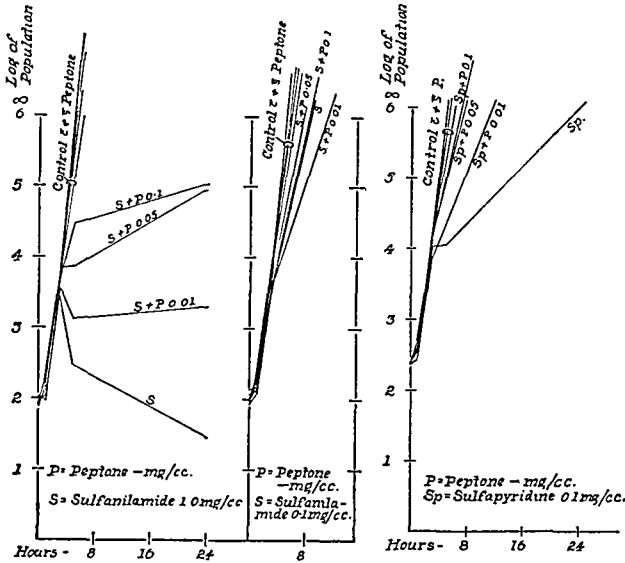


Fig. 2.—Effect of sulfanilamide on *Staphylococcus aureus*; inhibiting action of peptone (experiment 132 [Huff]).

of sulfanilamide to influence the course of ordinary staphylococcal infections is the result of the massive tissue injury usually associated with this type of infection. Producing as it often does a local abscess, there is initiated a profound increase in protein catabolism as demonstrated by Daft, Robschiet-Robbins and Whipple.⁸ Large amounts of protein-split products such as are present in protein intoxication may, we believe, simulate our experiments in which large amounts of peptone were added. Furthermore, staphylococci grown in serum tend to be resistant to adequate concentrations of sulfanilamide after the action of staphylococcus enzymes has so altered the medium as to render it favorable for staphylococcus growth.

COMPARISON OF THE EFFECTS OF PEPTONE ON THE ACTIONS OF SULFANILAMIDE AND SULFAPYRIDINE ON STREPTOCOCCI

In chart 3 is presented the comparison of the actions of sulfanilamide and sulfapyridine on the population curves of hemolytic streptococci in human serum with and without peptone. When peptone was excluded, the drugs induced similar curves. Both compounds produced sterilization at twenty-four hours, and the curves can almost be superimposed. This is in agreement with data obtained in numerous other experiments, namely that sulfapyridine in vitro is as effective against the hemolytic streptococcus as sulfanilamide itself but in general no more effective. It can be seen from the population curves resulting from the addition of varying concentrations of peptone that the effect of protein-split products is essentially the same for both drugs and that, as far as the streptococcus is concerned, sulfapyridine is no more able to overcome the inhibiting action of peptone than is sulfanilamide.

8. Daft, F. S.; Robschiet-Robbins, Frieda S., and Whipple, G. H.: Plasma Protein Given by Vein and Its Influence upon Body Metabolism, *J. Biol. Chem.* 123: 87 (March) 1938.

COMPARATIVE EFFECTS OF SULFANILAMIDE AND SULFAPYRIDINE ON PNEUMOCOCCUS TYPE III WITH AND WITHOUT PEPTONE

Chart 4 shows the population curves of pneumococcus type III obtained by the addition of small amounts of sulfanilamide and sulfapyridine to small inoculums of the organisms in human serum. In the one group of experiments peptone was not present in the mediums and in the other 1 mg. of peptone per cubic centimeter was added. The growth in the peptone-free group was not strikingly active during the first five hours, but finally the unfavorable conditions for growth were overcome and rapid multiplication took place. The addition of sulfanilamide so that the concentration became 1:40,000 produced a relatively high degree of bacteriostasis, and at twenty-four hours the population was about 30,000. With the same concentration of sulfapyridine only very few colonies appeared on the plate, and when the twenty-four hour serum medium was transferred to broth no growth occurred, indicating that sterilization had at this time become complete. A similar difference was noted with concentrations of 1:10,000 of the two drugs. Chemotherapeutic activities in vitro were consistent with the differences which are known to exist in the ability of these two drugs to attack the pneumococcus both experimentally and clinically in vivo.

The curves on the right, showing experiments in which 1 mg. of peptone per cubic centimeter was added, show that the higher concentration of sulfapyridine, namely 1:10,000, is to some extent able to overcome the growth stimulating effect of the peptone and to

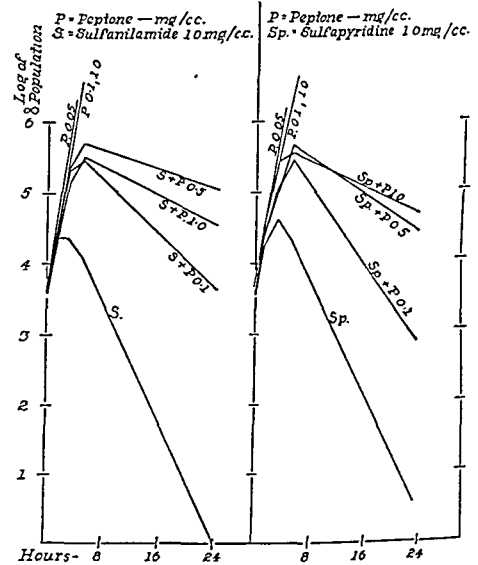


Fig. 3.—Comparison of the actions of sulfanilamide and sulfapyridine on hemolytic streptococci in serum, with variation in concentration of peptone (experiment 104).

restrict the outgrowth of the pneumococci. With a similar concentration of sulfanilamide very active outgrowth of the pneumococcus took place. This difference between the two drugs in overcoming the growth stimulating properties of peptone may account for the superiority of sulfapyridine in treating pneumococcal infections. It must remain, however, for further study to determine whether or not this is an important factor in explaining the difference in the effectiveness of the two drugs.

THE ROLE OF PEPTONE IN CONDITIONING THE ACTION OF SULFAPYRIDINE ON PNEUMOCOCCUS TYPE III IN SERUM

In chart 5 data are given which further analyze the inhibiting effects of peptone on the action of sulfapyridine on type III pneumococci. In the experiment shown in chart 4 the use of sulfapyridine 0.1 mg. per cubic centimeter made it possible to overcome completely the growth stimulating effect of 0.01 mg. per

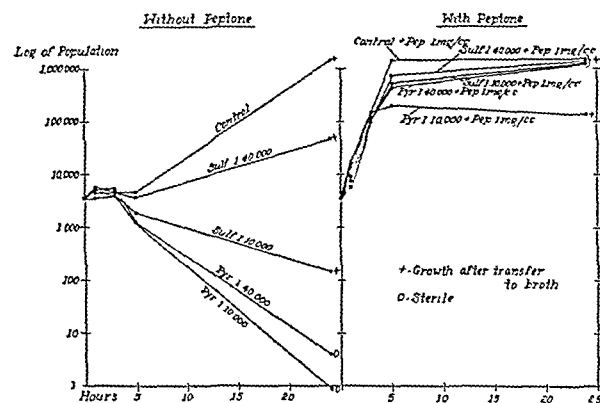


Fig. 4.—Comparison of sulfanilamide and sulfapyridine in pneumococcus type III in normal serum, with and without peptone.

cubic centimeter of peptone. That this concentration of peptone was stimulating in its effect on the pneumococcus is shown in the studies made in the control group, in which the rise in population with 0.01 mg. of peptone per cubic centimeter was far more rapid than was true in the peptone-free mediums. Furthermore, in this group the population curves tended to rise proportionately as the concentration of peptone was increased.

It is interesting to note the progressive trend of the curves to move upward, shifting from left to right on these charts, owing to the progressive diminution in concentrations of sulfapyridine. A concentration of 0.01 mg. per cubic centimeter had but little effect on limiting growth even in the absence of peptone. It seems possible to conclude from these experiments that the growth stimulating effect of peptone may be overcome by the presence of a hundred times as much sulfapyridine. This concentration of sulfapyridine is, of course, quite unpractical in view of the low solubility of the drug, unless one is to use the more soluble sodium salt.

COMMENT

In a previous publication⁴ reference was made to the work of Bainbridge, who in 1911 showed that certain bacteria were unable to utilize the complex proteins of egg albumin and blood serum as a source of nitrogen and that when inoculums of the organisms were added to mediums containing these proteins alone the organisms died out. However, when peptones were available in these same mediums bacterial growth was rapidly initiated and, once initiated, continued normally according to a characteristic growth curve. It appeared, therefore, that the bacterium gradually acquired the capacity finally to utilize the more complex protein substrate.

Normal human serum does contain minute quantities of free amino acids and other derivatives of protein catabolism. Since the organisms that are known to be susceptible to sulfanilamide are not in general actively proteolytic, it is reasonable to suppose that when they

are inoculated into blood serum they depend at least in part on obtaining assimilable nitrogen for protein metabolism from previously hydrolyzed protein. Since the concentration of such free amino nitrogen is rarely high it is obvious that the addition of very small traces of peptone may markedly alter the amount of assimilable nitrogen and thus significantly improve the status of the serum as a culture medium for nonproteolytic organisms, such as the hemolytic streptococcus. The fact that effective sulfanilamide action depends on the exclusion of added peptone suggests immediately that the drug must act in some way through interference with the ability of the bacteria to utilize the traces of assimilable nitrogen in whole blood, serum, urine or other body fluids.

It is possible that sulfanilamide combines in some way with the free amino nitrogen of protein degradation products and renders them unsuitable for bacterial utilization. This particular point is still under investigation, but other possible explanations of the precise mechanism involved are also being studied. Such a concept would appear to explain why the sulfanilamide compounds are active only against certain organisms and in certain specialized mediums.

Furthermore, it would explain the failure of sulfanilamide to destroy hemolytic streptococci in localized areas of tissue proteolysis, such as abscesses or heavily traumatized wounds. It would account for the failure of these drugs to act on the localized suppurative lesions of staphylococcal origin and the successful results which have at times attended its use in diffuse staphylococcal cellulitis and bacteremia. This hypothesis is consistent with the spectacular effects of sulfapyridine in pneumococcal infections, because of the minimal tissue injury in the lung in pneumococcal pneumonia.

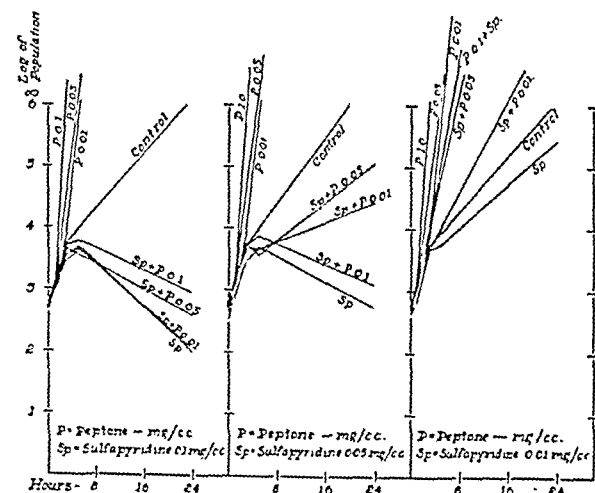


Fig. 5.—Role of peptone in conditioning the action of sulfapyridine on pneumococci type III in serum (experiment 130 [Rutter]).

SUMMARY

1. Sulfanilamide has a bacteriostatic and limited bactericidal action in vitro on hemolytic streptococci, staphylococci, pneumococci and colon bacilli. The magnitude of this effect is dependent principally on (a) the concentration of the drug and (b) the concentration of "peptone" in the culture mediums.

2. "Peptone," as used in this paper, connotes any product of protein digestion whether prepared artificially in vitro or through the operation of natural enzymatic processes in vivo.

3. It is our belief that sulfanilamide acts by interfering with the nutritional requirements of susceptible bacteria and that the bacteria can die out in a phagocyte-free environment through starvation and autolysis.

4. The addition of peptone to mediums such as serum, which are deficient in nitrogen easily assimilable by bacteria, supplies such an excess of nitrogenous material that the bacteriostatic action of sulfanilamide is to a large degree inhibited.

INTRAVENOUS AND RECTAL ADMINISTRATION OF SULFAPYRIDINE

IN PNEUMOCOCCIC PNEUMONIA

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AND

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In the past five months an attempt was made to observe and evaluate any advantages in a series of cases of pneumonia that might result from administering sodium sulfapyridine intravenously and sulfapyridine intrarectally.

In each case the diagnosis was confirmed by x-ray evidence. Preliminary blood culture and typing and culture of sputum were performed in all cases. The blood levels were determined for all patients save those of the oral group admitted later. These are being mentioned without consideration of blood levels.

Eighteen patients were first treated intravenously with sodium sulfapyridine. Of these sixteen were treated entirely by the intravenous route.

Thirteen patients were given sulfapyridine by the rectal method alone and one by the oral and rectal methods combined.

The investigation of the intravenous and rectal routes was decided on in an effort to improve on the results of oral treatment noted in sixty cases, thirty of which have been previously reported. Our hope was to eliminate or decrease nausea and vomiting, a secondary rise in temperature and spread of the disease, occasionally seen after the initial response (whether large or small doses were used), and to hasten recovery.

In our composite temperature chart the intravenous curve is continued only for eighteen hours, primarily showing the rapidity of drop compared with the response to rectal administration.

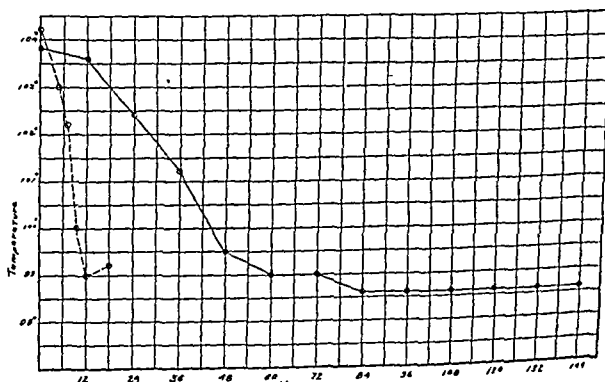
INTRAVENOUS SODIUM SULFAPYRIDINE THERAPY

In the first two cases, sodium sulfapyridine was given in 1 Gm. doses prepared by dissolving the drug in 1,000 cc. of saline solution. There was a temporary but immediate response, consisting of a drop in temperature of 2 or 3 degrees after one to three hours. The two patients were then placed on oral sulfapyridine therapy and a typical response followed. Although we have given as much as 4 Gm. in 20 cc. of saline solution, making a 20 per cent solution, with no bad reaction, we adopted 2 Gm. of sodium sulfapyridine in 20 cc. of physiologic solution of sodium chloride as the standard initial dose. We found that in sixteen cases this gave an average blood level of 3.7 mg. within five to sixty minutes. In fifteen cases of this group this dose was repeated in four to six hours and there resulted an average blood level of 6.3 mg. After

this second dose fourteen of the patients experienced a drop to normal temperature and an accompanying decrease of toxicity, pulse rate and other symptoms. This response occurred within six to twelve hours after the first dose. A fairly consistent response to treatment was obtained up to this point.

Of the fourteen patients who had received two injections of 2 Gm. each six had no subsequent rise in temperature and had uneventful recoveries. The remainder, on the other hand, experienced recrudescences of their fever from twelve to fifteen hours after their second injection, occasionally to a point as high as when treatment was begun, but without as much toxicity. At the time of this reactivation in eight, blood levels in all fourteen cases were found to average 2.2 mg., which indicated a rapid drop.

Further medication produced an elevation in blood level and a favorable lasting response and recovery in five of the fourteen cases. In nine cases when the drug was stopped third and subsequent temperature rises occurred, and again a low level of 1.4 mg. was noted from eight to twelve hours after the last injection, but reintroduction of treatment always terminated the rises. In the cases with this response a widely variable and uneven temperature curve resulted, as was the case with the blood level values. The fact that many patients were found to maintain an adequate blood level for much



Composite temperatures. The solid line indicates rectal therapy and the broken line intravenous therapy.

longer than the twelve hour period described has so far made any set routine impossible beyond the first two doses. In all but six cases we found that the drug concentration was diminished below an effective level at the end of an eight to twelve hour period. The average total dose in this intravenous group was 8 Gm., the smallest 2 Gm. and the largest 20 Gm. No nausea or vomiting occurred except that one patient experienced nausea after each injection.

Of the four patients who did not respond immediately to intravenous therapy,

1. C. C. had type XIX bacteremia and empyema and responded favorably after surgical drainage.

2. C. P., with type I bacteremia and an apparently overwhelming infection, had a blood level of only 3.2 mg. in spite of having received 18 Gm. of sodium sulfapyridine in thirty-six hours. He was given 200,000 units of type I serum on account of his low blood level and persistently positive blood culture, had interlobar empyema after leaving the hospital and was treated by repeated aspiration.

3. From T. J., aged 49, thought to have streptococcal pneumonia because of the sputum culture and the clinical course, type I pneumococcus was recovered by terminal lung puncture. His death will be discussed later.

4. F. D., with type VII pneumonia, whose temperature remained elevated for thirty hours, received 10 Gm. intravenously in 2 Gm. doses every six hours during the period. When the blood level reached 4 mg. a favorable response occurred and recovery was uneventful, including the subsidence of jaundice, which was present on admission. The icteric index decreased from 12 to 6 at the same time. A similar reduction of the icteric index was observed in five other patients, none of whom had clinical jaundice.

RECTAL SULFAPYRIDINE THERAPY

Fourteen patients who did not appear too ill on admission had rectal treatment alone, and all recovered. Sulfapyridine was initially administered in 6 Gm. doses suspended in 3 ounces of water with from 0.66 to 1 Gm. of sodium bicarbonate. This formed an effective non-irritating suspension of the drug. After a cleansing enema this suspension was introduced as a retention enema. At four hour intervals 2 Gm. doses and later 3 Gm. doses were employed. Blood levels were lower than those obtained by the oral and intravenous methods and averaged for the group 3.0 mg., though patient F. C. reached a concentration of 5.4 mg. It was found that three times the usual oral dose was required to produce adequate blood levels. The clinical response was slower than with the oral route but was uniformly satisfactory. The average time required for the temperature to reach normal was forty-eight hours, as compared with thirty-six hours in those treated orally and twelve hours in those treated intravenously. The same decrease in toxicity was also noted. Only one patient, F. C., exhibited nausea and vomiting. No evidence of rectal irritability was noted. Therefore we believed that the rectal route, with the dosage as outlined, is a satisfactory and less disturbing method for patients showing gastric irritability and not too seriously ill.

THE SEVEN FATAL CASES IN THE SERIES OF NINETY-TWO CASES WITH ORAL, INTRAVENOUS AND RECTAL TREATMENT

1. J. G., aged 53, had type III pneumonia. Blood culture yielded negative results. Oral treatment was begun thirty-six hours after onset and death occurred on the fifth day. On the fourth day the blood level was 14.0 mg. total, 13.3 mg. free; on the fifth day, 14.5 mg. total, 9.0 free. The white cell count was 27,000 with 68 per cent polymorphonuclears and 30 per cent band forms. This patient was admitted in poor condition and showed no favorable response.

2. T. J., an alcoholic man aged 49, mentioned previously, was admitted on the fifth day of illness with a pulse rate of 136 and respiratory rate of 36, in a markedly toxic and delirious state. He received 8 Gm. intravenously in twenty-four hours, which produced a blood level of only 2.4 mg., but the temperature was normal forty-eight hours after the initial dose. The pulse remained rapid, and the patient continued to be toxic. With another abrupt rise in temperature intravenous administration of 2 Gm. was followed by normal temperature persisting throughout his last forty-eight hours. His sputum cultures were reported to contain chain cocci, but a terminal lung puncture showed type I pneumonia. Though this patient died afebrile and in vasomotor collapse with a rapid running pulse, we feel that he should have had the benefit of heavier dosage.

3. A. O., a desperately ill alcoholic man aged 60, was admitted on the fifth day of illness. There were type II organisms in the sputum, and the blood culture was positive. The pulse rate was 160 and the liver enlarged. He died twenty-four hours later. He received 2 Gm. intravenously every two hours for five doses without response. The blood level was 6.1 mg. total and 3 mg. free.

4. R. S., a man aged 74, was delirious and comatose on admission, with a large liver, jaundice and a temperature of 104 F. He was given sulfapyridine orally, and the temperature,

pulse and respiration were normal for three days. Then the temperature fell to between 95 and 96 F. Clinically he was much improved. He died suddenly with normal temperature six days after admission. Autopsy showed resolving pneumonia and toxic hepatitis, the cause of which was not definitely determined. He had had 34 Gm. of the drug in all.

5. McG., a man aged 36, had type II organisms in the sputum and a positive blood culture. He was admitted on the seventh day and died five days later. He had 23 mg. of sulfapyridine in all. He became progressively more toxic. On the twelfth day he had 200,000 units of type II serum. The white cell count was 17,000 with 83 per cent polymorphonuclears and 10 per cent band forms. Death occurred in vasomotor collapse.

6. C. D., a man aged 40, was admitted on the seventh day of illness with type I organisms in the sputum, a positive blood culture and empyema, which was evacuated on the eighteenth day. Death occurred on the fifty-first day. Autopsy showed acute vegetative endocarditis, pneumococcal meningitis and chronic empyema. The total dose (oral) was 44 Gm. in fifty-one days, but of this 30 Gm. was given in the first week. Five blood levels varied between 2.6 and 7.2 mg. (total). A violent allergic reaction occurred after 30,000 units of serum was given, though conjunctival and cutaneous tests had been negative.

7. K., a woman aged 76 with type XII pneumonia, was admitted in coma. She had an initial favorable response for three days but died on the sixth day. She had sustained a head injury ten days before admission, which may very well have been the primary factor in her death.

SUMMARY

Ninety-two patients were treated with sulfapyridine and its sodium salt, with a mortality of 7.6 per cent. Of this number fourteen were treated intrarectally and eighteen with sodium sulfapyridine intravenously. Although this is too small a number to be of value statistically, certain facts are apparent and inferences may be made concerning the value of these forms of treatment. Rectal administration almost eliminates nausea. Blood levels tend to be lower, and response to therapy is slower.

The intravenous use of sodium sulfapyridine in the manner described caused no local or systemic reaction. Nausea occurred after injections in only one case. The therapeutic effect was rapid save in the four cases considered in detail. There was difficulty in maintaining constant blood levels, and a consequent erratic course of recovery was found to be the chief difficulty in this form of treatment. Seven deaths occurred in ninety-two cases and were analyzed. We are of the opinion that, when there is no initially favorable reaction to sulfapyridine, serum should be used in full doses.

From a study of response and blood level, we are of the opinion that a desirable method of administering these drugs to seriously ill patients is to give sodium sulfapyridine intravenously at first and follow it immediately with sulfapyridine administered orally.

66 East Sixty-Sixth Street.

The Keynote to Sir William Osler's Character.—It has been said that he would have achieved greatness in any career, but it is certain that in no other walk of life would he have found so much exercise for his many gifts or fulfilled himself and been so happy as in the practice of medicine. His intense sympathy, his genius for friendship with young and old, his capacity for teaching and organization—for all these medicine gave ample scope. The keynote to his character was struck in a remark he made to his students: "There are people in life and there are many of them whom you will have to help as long as they live. They will never be able to stand alone."—Langdon-Brown, Sir Walter: *Thus We Are Men*, New York, Longmans, Green & Co., 1939.

SULFANILAMIDE IN TREATMENT OF SORE THROAT DUE TO HEMOLYTIC STREPTOCOCCI

WITH CONTROLS

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In a previous study¹ it was found that approximately one fourth of the illness among the nurses under our care was due to tonsillitis and pharyngitis. Two thirds of these cases were caused by hemolytic streptococci. While this incidence of sore throat may be slightly higher than that in a similar age group of the general population, it is probably lower than the incidence among children. Because of the great frequency of this condition it is likely that as much sulfanilamide is administered for sore throats proved or presumed to be due to hemolytic streptococci as for any of the great variety of infections for which it seems to be useful. The medical literature abounds with reports on the use of this drug for hemolytic streptococcus pharyngitis and tonsillitis. Many workers report almost uniformly favorable results.² Others, while impressed with results of the use of sulfanilamide in other streptococcal infections, have noted little favorable effect in ordinary hemolytic streptococcus tonsillitis and pharyngitis.³ Coburn and Moore⁴ found that sulfanilamide administered to rheumatic subjects after the onset of streptococcal throat infections did not prevent recrudescences. However, in a series of eighty rheumatic children who were given the drug prophylactically seventy-nine escaped hemolytic streptococcus infection and signs of activity of rheumatic infection. Schenck,⁵ in a review of the use of the drug in otolaryngology, points out that most observers report favorable clinical responses to the drug but that the carrier state was usually not much affected. In our search of the literature we were unable to find a single study in which there were adequate controls.

Our own series is not large but may be of some value because the sulfanilamide treated patients were compared in as many respects as lent themselves to statistical analysis with a group being treated under identical conditions but without this drug.

The present study was begun two years ago. The subjects were all nurses of Cook County Hospital and Evanston Hospital who contracted hemolytic streptococcus pharyngitis or tonsillitis while on duty. There were occasional accompanying infections of the nasal

passages and sinuses—five among the sulfanilamide treated group, six among the control group. Only patients with severely inflamed throats, proved to harbor beta hemolytic streptococci and with fever, were selected for the study; alternate patients were treated with the drug. Of the thirty-one sulfanilamide treated patients only three had a temperature below 100 F. and all but five had exudate on the mucous membranes of the pharynx or tonsils. In the control series of thirty-six cases five had a temperature below 100 F. and all but four had exudates. Many patients originally in the treated series were excluded from the study because treatment was begun after the fifth day of illness or because the drug had to be stopped because of reactions before a therapeutic effect could be expected. Aside from the use of sulfanilamide the patients of the two groups were treated in exactly the same way, i. e. with rest in bed until the temperature had been normal at least three days, hot alkaline gargles and either codeine or acetylsalicylic acid for aching in the body. The patients were not given sulfanilamide until their cultures had been reported positive for hemolytic streptococci, so that on the average treatment was begun 2.8 days after onset. The average duration of sulfanilamide treatment was 5.6 days. The dosage varied slightly according to the

TABLE 1.—Comparison of the Clinical Course of the Sulfanilamide Treated Group with the Group Receiving No Sulfanilamide

	Sulfanilamide Treated Group (31 Cases)	Control Group (36 Cases)
Average days ill before hospitalization.....	1.4	1.9
Average days of hospitalization per case.....	11.6	9.9
Average days off duty per case.....	18.8	17.5
Average days carrying hemolytic streptococci per case.....	19.0	19.1
Average leukocyte count.....	14,139	15,986
Average duration of fever (days).....	6.84	4.1
Average highest fever.....	102.2	101.5
Average duration of exudate on throat.....	5.4	6.1
Average duration of subjective complaint of sore throat.....	9.1	8.0
Average duration of cervical adenopathy.....	11.0	9.6
Percentage of complicated cases.....	42%	31%

tolerance of the patients for the drug, but the average daily dose was 3.6 Gm. (54 grains). On the first day from 5 to 6 Gm. (75 to 90 grains) was given, divided usually into four doses. After that from 0.6 to 1.0 Gm. (10 to 15 grains) was given at four hour intervals through the day until the drug was discontinued. The average blood level attained was 6.38 mg. per hundred cubic centimeters. Apparently our method approximated that used by Long and Bliss in a series of forty-six cases.⁶ In their series, on the average treatment was begun 2.3 days after onset and the average duration of treatment was five days. These workers state that "a blood concentration of 4 to 6 mg. per cent of sulfanilamide is generally all that is needed, and in many instances the infection may be controlled with lower levels of the drug." They consider the proper dose for adults to be 1 Gm. (15 grains) every four hours day and night at the start. After one day of normal temperature they cut this dose in half, then rapidly decrease as convalescence is established. Long states that none of his treated patients had complications.

From the Departments of Medicine of Northwestern University Medical School and the University of Illinois Medical School.
1. Rhoads, P. S., and Afremow, M. L.: Clinical and Statistical Study of Sore Throat in Young Adults. Arch. Path. 26: 403 (July) 1938.
2. Long, P. H., and Bliss, Eleanor A.: F and Its Derivatives: Clinical Observations of Infection Due to Beta Hemolytic Streptococcus. J. Clin. Invest. 12: 1 (Feb.) 1937. Smith, Alexander: Chemotherapies, Particularly Streptococcal Tonsillitis, L. Gallagher, J. R.: Observations on the Throat. Pharyngitis. Am. J. M. Sc. 104: 830 (Dec.) 1937. and Blake, F. G.: Clinical Experiment of Beta Hemolytic Streptococcus. J. Clin. Invest. 12: 1 (Feb.) 1937. McLaughlin, J. G.: Sulfanilamide & Larynx. 48: 23 (March) 1939.
3. Schnitzer, M. A.: Sulfanilamide: A Review. New England J. Med. 218: 503 (March 24) 1938. Lockwood, J. S.: Coburn, A. F., and Stokinger, H. E.: Studies on the Mechanism of Action of Sulfanilamide. J. A. M. A. 111: 2259 (Dec. 17) 1938. Keefe, C. S.: Streptococcal Disease. New England J. Med. 220: 109 (Jan.) 1939.
4. Coburn, A. F., and Moore, L. V.: The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, with Special Reference to Rheumatic Fever. J. Clin. Investigation 18: 147 (Jan.) 1939.
5. Schenck, H. P.: Use of Sulfanilamide in Otolaryngology. Arch. Otolaryng. 28: 698 (Nov.) 1938.

6. Long, P. H., and Bliss, Eleanor A.: The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine and Allied Compounds, New York, Macmillan Company, 1939, p. 169.

RESULTS

Table 1 shows that in our study the clinical course of the sulfanilamide treated series was practically identical with that of the untreated controls. The complications of the sore throats in the two groups were also almost the same. A striking feature of pharyngitis and tonsillitis due to hemolytic streptococci is the profound

TABLE 2.—Comparison of Complications in the Sulfanilamide Treated Group and the Control Group

	Sulfanilamide Treated Group (31 Cases)	Control Group (36 Cases)
Total number of complicated cases (exclusive of toxic reactions to the drug).....	13	11
Paranasal sinusitis	5	6
Chronic carriers (beyond 14 days).....	11	11
Otitis media	2	1
Mastoiditis	2	..
(nonsuppurative)		
Severe asthenia incapacitating the patients more than one week after fever had subsided	6	1
Acute peritonitis	1	2
(no abscess) (abscess)		
Late recurrence of fever.....	2	..
Rheumatoid arthritis	2	..
Persistent pharyngitis over a long period.....	..	2
Erythema multiforme .....	..	1

asthenia which so often incapacitates the victims for many days after the fever, cervical adenitis and other objective signs of active disease have subsided. This complication was much more frequent in our sulfanilamide treated group, possibly as the result of treatment. Those patients found to have positive cultures for hemolytic streptococci two weeks or more after the initial infection are listed in the series as "carriers." It will be seen that sulfanilamide did not influence the carrier state, there being eleven carriers in each group.

Cervical adenopathy occurs to some degree in nearly every case of streptococcic pharyngitis and tonsillitis. It is not considered a complication by us unless the adenopathy is thought to prolong the disability an unusually long time or unless suppuration occurs. Hence cervical adenitis does not appear as a complication in the tabulation of either series.

TABLE 3.—Toxic Reactions to Sulfanilamide in Thirty-One Cases

Nausea and vomiting.....	8
Dizziness and headache.....	4
Rash	4
Leukopenia	3
Severe asthenia (in absence of other complications).....	2
Precordial pain and bradycardia.....	1
Febile reaction	1
Tinnitus	1
Hallucinations	1
Severe mental depression.....	1
Total number exhibiting toxic signs (cyanosis not included) 16	

REACTIONS TO SULFANILAMIDE

Some degree of cyanosis was observed in practically every case in which full doses of sulfanilamide were administered and was not listed as a toxic reaction in the tabulations. Table 3 shows that sixteen of the thirty-one sulfanilamide treated patients had one or more of the usual reactions to this drug. Nausea and vomiting were the most frequent reactions; leukopenia, precordial pain and hallucinations were the most alarming. These reactions subsided after withdrawal of the drug. Several other cases are not included in this series

because severe toxic manifestations led to discontinuance of the drug before an adequate amount could be given.

SUMMARY AND CONCLUSIONS

In our series of thirty-one sulfanilamide treated patients and thirty-six controls treated under similar conditions but without sulfanilamide, this drug was not found to reduce the severity of the symptoms, shorten the period of incapacity, reduce the incidence of complications or reduce the duration of the carrier state. Toxic manifestations of the drug other than the usual cyanosis occurred in one half of the cases in which sulfanilamide was administered. In a few instances these reactions were serious enough to cause genuine concern.

It is not wise to make sweeping generalizations on the basis of one series of controlled cases. Sulfanilamide is a drug of proved value in severe infections of deep structures due to the hemolytic streptococcus. However, in the average uncomplicated case of tonsillitis or pharyngitis due to hemolytic streptococci the advisability of its routine use is questionable. Certainly no physician should be censured for withholding the drug in these conditions unless complications such as severe cervical adenitis, paranasal sinusitis, otitis media, mastoiditis or meningitis supervene.

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THE PRODUCTION OF SULFAPYRIDINE RENAL CALCULI IN MAN

FOLLOWING ADMINISTRATION OF SULFAPYRIDINE

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The great interest in the therapeutic use of sulfapyridine has brought forward a multitude of reports showing its efficacy in acute infections. These articles have been closely followed by observations on the toxic manifestations of the drug; apart from gastrointestinal disturbances and a tendency for blood destruction, emphasis must be placed on the effect on the kidneys.

In view of the fact that most of the absorbed drug is excreted by the kidneys, either in the pure or in the conjugated form, it is conceivable that, if precipitating factors are introduced, serious traumatic or mechanical effects might be produced. That crystals of sulfapyridine are precipitated in the kidney tubules and pelvis in certain species of mammals has been shown by many observers.

Antopol and Robinson¹ were the first investigators to report the appearance of uroliths in monkeys, rats and rabbits following the oral administration of large amounts of sulfapyridine. These investigators also described changes in the kidneys and ureters secondary to the deposition of sulfapyridine crystals and stones. In the milder cases they found a simple calculous ureteritis and pyelitis causing hematuria, but in the more severe cases marked pyelonephritis producing definite nitrogen retention in the blood. The sulfapyridine stones were discovered to be nonopaque to x-rays, and of particular significance was their observa-

From the New York Hospital and the Departments of Medicine and Urology, Cornell University Medical College.
1. Antopol, Williams, and Robinson, *Urol.* 1934, 2, and *Bull. Pathology After Oral Administration of 2(Sulfapyridine) 1* (Sulfapyridine), *Proc. Soc. Exper. Biol. & Med.* 40:423 (March) 1934.

tion that the concretions when not excessive were later redissolved or washed out. Gross, Cooper and Lewis² analyzed the urinary stones occurring in rats after sulfapyridine administration and found that they were composed of 6.4 per cent free sulfapyridine and 64.1 per cent acetylsulfapyridine. Toomey,³ in a communica-

the other by pyelographic study in which crystals and concretions of sulfapyridine were found also in the urinary bladder. A brief description of these cases already has been reported, but because of the interest in this material we are making a more detailed presentation.

REPORT OF CASES

CASE 1.—History.—R. L., a married woman aged 40, was admitted to the Medical Pavilion of the New York Hospital Dec. 27, 1938, with weakness, fatigability, afternoon fever, loss of weight and anorexia of three months' duration.

At the age of 3 years the patient had inflammatory rheumatism involving the knees, ankles and wrists. Cardiac murmurs were detected after this illness, and from that time physical activities were always restricted. At the age of 8 there was a recurrence of inflammatory rheumatism.

Examination.—The temperature was 38.2 C. (100.8 F.), pulse rate 94, respiratory rate 18, and blood pressure 105 systolic, 60 diastolic. The patient was poorly nourished. The middle finger of the right hand in the region of the middle phalanx was swollen but not discolored or tender. No other joints were involved. The patient was in no particular discomfort and was not dyspneic or orthopneic. The heart was slightly enlarged. A short systolic thrill was felt at the apex. A soft, rough systolic murmur was heard best at the apex, and a crescendo presystolic murmur was heard, loudest in the mitral area. The liver and spleen were easily palpable but were not tender.

Urinalysis showed a specific gravity of 1.008 and no albumin or sugar. Microscopic study showed no red blood cells or casts but a few white blood cells. The hemoglobin content of the blood was 80 per cent, red cell count 4,000,000 and white cell count 7,500. Serologic tests were negative. Blood culture yielded a nonhemolytic alpha prime streptococcus.

Course in the Hospital.—On the basis of the physical features and the positive blood culture, the diagnosis of subacute bac-

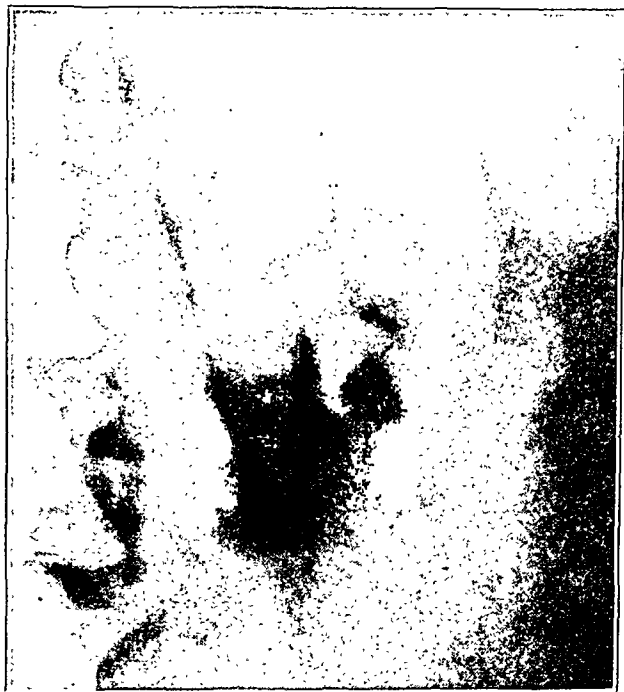


Fig. 1 (case 2).—Excretory pyelogram taken fifteen minutes after the dye was injected. A calculus, nonopaque to x-rays, is in the pelvis of the left kidney. Also there is evidence of hydronephrosis and delayed excretion. This study was made three days after sulfapyridine therapy had been instituted and twenty-four hours after the sudden appearance of hematuria and of pain in the left flank. Only 11 Gm. of the drug had been taken when this reaction occurred.

tion to THE JOURNAL, described confirmatory experiments and suggested the dangers of sulfapyridine urolithiasis in the human being.

Hematuria in the human being following sulfapyridine therapy has been reported by a number of investigators.⁴ The occurrence, in addition to hematuria, of renal colic and nitrogen retention in human cases was described first by Southworth and Cooke⁵ and more recently by Tsao, McCracken, Chen, Kuo and Dale.⁶ The patients described by the latter investigators were children, one of whom died of uremia developing after sulfapyridine therapy.

In a recent report we⁷ described the renal complications occurring in 323 cases treated with sulfapyridine. In this series there were three cases of nitrogen retention, four cases of hematuria without proved stones and two cases of hematuria in which there was sulfapyridine calculous formation, in one proved at autopsy and in



Fig. 2 (case 2).—Pyelogram made fifteen minutes after the dye was injected, showing a normal left kidney. The calculus and evidence of hydronephrosis no longer appear. This study was made twelve days after the attack of hematuria and colic.

terial endocarditis was made. The patient was given sulfanilamide 1.2 Gm. six times daily until a total of 55.2 Gm. had been given. This drug was discontinued and sulfapyridine was administered in doses of 1 Gm. six times daily, and until shortly before death 555 Gm. had been received. The sulfanilamide had had no clinical effect on the patient, but with the sulfapyridine the temperature was reduced, and in spite

2. Gross, Paul; Cooper, F. B., and Lewis, Marion: Urinary Concretions Caused by Sulfapyridine, *Proc. Soc. Exper. Biol. & Med.* **40**:448 (March) 1939.

3. Toomey, J. A.: Urinary Concretions and Sulfapyridine, *J. A. M. A.* **113**:250 (July 15) 1939.

4. Lawrence, E. A.: Recent Advances in the Treatment of Pneumonia, *International Review of Recent Advances in Medicine* **2**, No. 3, 1939. Graham, D.; Warner, W. P.; Dauphinee, J. A., and Dickson, R. C.: The Treatment of Pneumococcal Pneumonia with Dagenan, *Canad. M. A. J.* **40**:325 (April) 1939. Pepper, D. S.; Flippin, H. F.; Schwartz, M. A., and Lockwood, J. S.: The Results of Sulfapyridine Therapy in 400 Cases of Typed Pneumococcal Pneumonia, *Am. J. M. Sc.* **108**:22, 1939.

5. Southworth, Hamilton, and Cooke, Crispin: Hematuria, Abdominal Pain and Nitrogen Retention Associated with Sulfapyridine, *J. A. M. A.* **112**:1820 (May 6) 1939.

6. Tsao, Y. F.; McCracken, M. E.; Chen, Ji; Kuo, P. T., and Dale, C. L.: Renal Complication in Sulfapyridine Therapy, *J.A.M.A.* **113**:1316 (Sept. 30) 1939.

7. Plummer, Norman, and Ensworth, Herbert: Sulfapyridine in the Treatment of Pneumonia, *J.A.M.A.* **113**:1847 (Nov. 18) 1939.

of some nausea the patient was much more comfortable. The blood cultures at several examinations were sterile and at all times showed a colony count lower than on admission. The blood hemoglobin level was slightly reduced, but at no time did it go below 70 per cent. The urine showed a few white blood cells and eight days before death showed a large number of

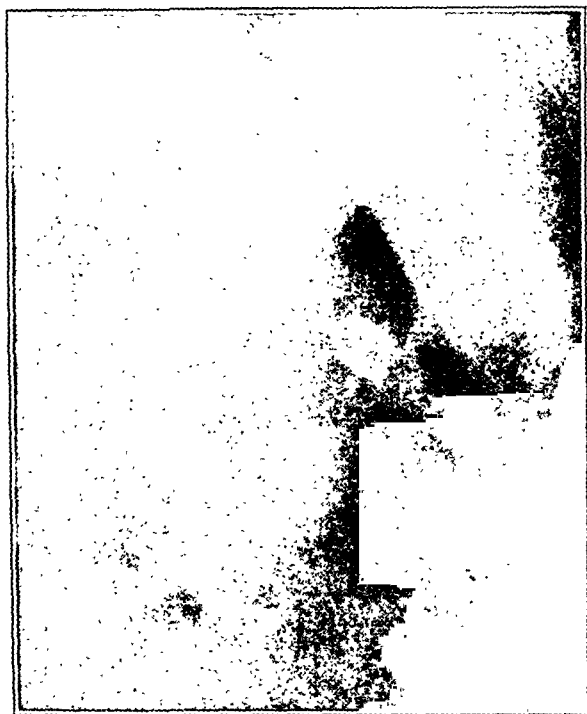


Fig. 3 (case 2).—Pyelogram made seventy-nine days after the reaction, again showing a normal left kidney.

red blood cells but no gross blood. The blood sulfapyridine varied from 4 mg. to 9 mg. per hundred cubic centimeters. On the one hundred and sixteenth hospital day the patient suddenly had convulsive seizures and lapsed into a stupor. Later there developed a stiff neck and a positive Babinski sign on the right side, and lumbar puncture revealed an increased pressure and grossly bloody spinal fluid. The course was rapidly downhill, and the patient died on the one hundred and seventeenth hospital day.

Postmortem Examination.—In the pelvis of the right kidney there were found numerous petechiae and in one calix a colorless stone with a rough surface, measuring 0.5 cm. across. Around this stone were two very small soft sandy crystalline masses. The urinary bladder contained no stones or concretions. When crushed on a slide and examined microscopically, the stone was seen to be made up of coarse rough wedge-shaped striated colorless crystals of which the base and one side were straight, while the third side was ragged. The point was usually sharp. A qualitative test for sulfapyridine was positive. A quantitative test⁸ showed the stone to be composed of about 97 per cent sulfapyridine. The difficulty of solubility was such that all acetylated sulfapyridine was transformed into the free form in accomplishing solution, so that the proportion that was originally free was not determined.

CASE 2.—History.—K. K., a man aged 46, Greek, was admitted to the medical pavilion April 28, 1939, with pain on respiration in the right lower part of the chest and cough with pink sputum. The symptoms had been present for eighteen hours and a chill occurred shortly before admission. The past history was irrelevant.

Examination.—The temperature was 40.2 C. (104.4 F.), pulse rate 120, respiratory rate 36 and blood pressure 140 systolic, 62 diastolic. The patient was flushed and slightly dyspneic.

Physical signs, confirmed by x-ray study, revealed pneumonia of the right lower lobe. The remainder of the physical examination was noncontributory.

Urinalysis showed a specific gravity of 1.020, acid pH, no sugar or albumin and no cells on microscopic examination. The red blood cell count was 4,500,000 with the hemoglobin content 98 per cent; the white cell count was 12,600. The sputum yielded pneumococcus type III. The blood culture was negative. The Wassermann reaction was 4 plus.

Course in Hospital.—The patient was given the usual supportive measures for pneumonia, and sulfapyridine was administered orally 2 Gm. as an initial dose and 1 Gm. every four hours. There was rapid improvement in the chest condition. Forty-eight hours after admission the patient complained of severe pain in the left flank and passed bloody urine. He received 11 Gm. of sulfapyridine prior to this attack, and the drug was promptly discontinued. The blood sulfapyridine determination was too low to read. An excretory pyelogram on May 1 (fig. 1) showed delayed function in the left kidney with hydronephrosis and a negative shadow in the renal pelvis. A plain roentgenogram of the abdomen did not show any evidence of opaque calculus. Owing to the persistent pain, cystoscopy and retrograde pyelography were done May 3. Cystoscopy revealed the trigon covered with whitish masses of tiny crystals, and a clot protruding from the left ureteral orifice was also studded with crystals. These crystals were washed out for examination and a catheter was easily passed 25 cm. to the left renal pelvis. The urine specimen from each kidney contained no crystals. The function of the left kidney was markedly reduced in urea and phenolsulfonphthalein output as compared with that of the right kidney. The pyelogram again revealed the negative shadow in the left renal pelvis. There was a definite diminution in urinary output for four days. The renal pain on the left persisted for eight days;

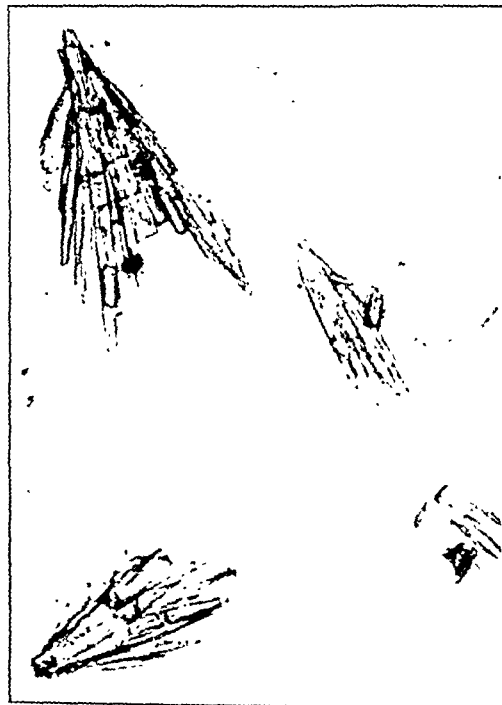


Fig. 4 (case 2).—Sulfapyridine crystals (magnified) washed from the urinary bladder.

crystals were not found in the urine after the sixth day, but hematuria persisted until the eighth day. An excretory pyelogram May 12 (fig. 2), fourteen days after the initial attack, revealed a normal left kidney without a filling defect. Results of urinalysis were normal. The lung by this date was clear, and the patient had been afebrile for five days. He was followed at weekly intervals and remained asymptomatic. An excretory pyelogram July 15 (fig. 3), two months after the attack, again showed a normal left kidney.

⁸ This examination was made by Dr. Jacob Farth.

⁹ These tests were made under the direction of Dr. Ralph G. Sullivan.

*Laboratory Report on Crystals Found in the Bladder.*²—Examination of the crystals revealed small irregular friable white masses. Microscopically these were made up of rather easily broken up bundles of long pointed wedge-shaped, sometimes notched, colorless crystals. On treatment with acid and azotization they gave a typical reaction for sulfapyridine. Morphologically these crystals resembled the crystals from a kidney (case 1) which were identified as sulfapyridine (fig. 4).

SUMMARY AND CONCLUSIONS

1. Two patients had renal calculi after sulfapyridine treatment, proved at postmortem examination and by pyelography, respectively. Both patients had hematuria and one also had renal colic. One had had only 11 Gm. of the drug and the other 555 Gm.

2. Pyelograms in one of the cases showed calculi, nonopaque to x-rays. The serial study indicates that later the calculi dissolved or were washed out and the kidney function returned to normal.

3. The features of these two cases, together with the experimental studies reported by other investigators, indicate that hematuria and other urinary symptoms occurring after sulfapyridine administration are caused by the deposition of sulfapyridine crystals and concretions in the kidneys and ureters.

4. Frequent examinations of the urine, particularly for red blood cells, should be made during sulfapyridine therapy. The drug should be withheld or given very cautiously if hematuria occurs or if the patient is known to have a diminished kidney function.

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SULFANILAMIDE IN THE TREATMENT OF CHANCROID

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PASADENA, CALIF.

AND

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Since sulfanilamide was first found to be of value in hemolytic streptococcal infections, the question of ascertaining its action in infections caused by the hemophilic streptobacillus of Ducrey suggested itself.

Previous to the present writing, reports on this subject, all of which have been encouraging, have come from three British clinics¹ and from one American group.² Since we have available a large hospitalized venereal service, it is felt that our experiences are worthy of record.

Sulfanilamide has been used in the treatment of chancroid at the Cleveland City Hospital since July 1937. This report covers a series of thirty-seven cases, which were very carefully selected and were considered suitable for this study. For comparison there is also presented, as a control group, a series of sixty similar cases, most of which were seen before July 1937, and which were treated by other methods.

From the Department of Dermatology and Syphilology of the Cleveland City Hospital, service of Drs. H. N. Cole and J. R. Driver, and Western Reserve University School of Medicine.

1. Hanschell, H. M.: Sulfanilamide in Treatment of Chancroid. *Lancet* 1: 886 (April 16) 1938. Hutchinson, Alexander: Treatment of Chancroidal Bubo with Sulfanilamide. *ibid.* 1: 1047 (May 7) 1938. Batchelor, R. C. L., and Lees, Robert: Treatment of Chancroid with Sulfanilamide. *Brit. M. J.* 1: 1100 (May 21) 1938.

2. Kornblith, B. A.; Jacoby, Adolph, and Wisengrad, Michael: Treatment of Chancroid with Sulfanilamide. *J. A. M. A.* 111: 523 (Aug. 6) 1938; Sulfanilamide in Treatment of Chancroid. *New York State J. Med.* 39: 364 (Feb. 15) 1938.

CRITERIA FOR SELECTION OF CASES

No patients were included if the diagnosis was purely clinical.

All patients with buboes and with positive Frei and chancroidal intracutaneous tests were eliminated unless there was a history and/or a scar of a previous bubo to account for the positive Frei test, and also unless a tissue smear was positive for *Bacillus haemophilus* of Ducrey.

Also eliminated from the reported series were all cases of chancroid complicated by early infectious syphilis. This was done because even though dark field examination was negative the possibility still remained

LESION	SERIES	S	P	DAYS REQUIRED FOR HEALING				
				10	20	30	40	50
BUBO, unruptured	CONTROL	M	13	[Healed by Day 13]				
	TREATED	F	2	[Healed by Day 12]				
BUBO, ruptured	CONTROL	M	5	[Healed by Day 33]				
	TREATED	F	3	[Healed by Day 17]				
ULCER not situated on glans penis	CONTROL	M	30	[Healed by Day 102]				
	TREATED	F	5	[Healed by Day 14]				
ULCERATION of glans penis	CONTROL	M	12	[Healed by Day 173]				
	TREATED	F	7	[Healed by Day 173]				
ULCERATION of glans penis	CONTROL	M	4	[Healed by Day 173]				
	TREATED	F	3	[Healed by Day 173]				

Results of treatment. S indicates sex and P the number of patients.

that part of the lesion could be an unrecognized chancre which might heal rapidly as a result of specific anti-syphilitic therapy and thus invalidate the reported results.

In order to compare our results with those of previous authors, our cases are divided into those with and those without buboes. The latter group has been further divided into cases with lesions on the glans penis and those with lesions on other dermal structures. This division was made because lesions on the glans heal much more slowly than those in other locations. Whether or not the buboes were ruptured made considerable difference in the time required for healing in the control group, so cases with bubo in the treated series were again classified as those with ruptured and those with unruptured buboes.

DOSAGE

Various daily doses were used and evaluated. The average for the total group was 46 grains (3 Gm.) a day. The total dose varied between 280 and 950 grains (18 and 62 Gm.) and averaged 642 grains (42 Gm.) per patient. After the initial dose of from 3 to 4 Gm. the maintenance dose was determined by the clinical response and of course by the weight and age of the patient. Toxic symptoms such as dermatitis, purpura and cyanosis were carefully watched for, and total blood counts and blood sulfanilamide determinations were frequently done (at least twice a week) in order to guide the maintenance dosage. It became apparent that a high maintenance dosage is of the utmost importance. The least desirable combination is a low initial and a low maintenance dose. The next least desirable is a high initial and a low maintenance dose. The low initial and high maintenance combination is more desirable, while the high initial and high maintenance combination is the most desirable if proper precautions, such as blood study and alkalization, are taken to avoid toxic reactions.

The results observed, according to the previously mentioned various types of lesions, are incorporated in the chart and are self explanatory. The graph indicates days required for healing in each instance and does not represent the total period of hospitalization.

It is noteworthy that the duration of the disease before admission to the hospital varied between two and 365 days and averaged for the control group thirty-five days and for the treated group thirty-two days.

The diagnostic period varied between one and twenty-seven days and averaged two days for the control group and slightly more than five days for the group treated with sulfanilamide. This longer diagnostic period for the latter group indicates that more careful study was made of them in order to be sure they were proper cases for evaluation of the action of the drug. In order to observe the results further, the treated patients were hospitalized for an average of more than six days after complete healing had occurred and they were dismissed for further observation as outpatients.

RESULTS

The results observed in this hospital compare favorably with those reported elsewhere as "dramatic" or "all healed within two weeks." Including all the various types of lesions, the average period of time required for healing in the control group was slightly more than thirty-two days. For the sulfanilamide treated group, this time varied from seven to twenty-three days and averaged 15.7 days, in comparison.

Chancroidal ulcers situated elsewhere than on the glans penis respond best to treatment.

Chancroidal bubo, unruptured, is next most responsive.

There is little difference in the response to sulfanilamide of chancroidal bubo, ruptured, and of ulceration of the glans penis, but the latter lesion is slightly less responsive.

CONCLUSIONS

Sulfanilamide has well known toxic possibilities and therefore should not be used in a routine manner for chancroid without careful control. This drug is efficient, even in resistant cases, and if carefully controlled can be used with gratifying results.

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THE USE OF VITAMIN B₁ FOR THE RELIEF OF PAIN IN VARICOSE ULCERS

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Whereas varicose ulcers of the lower extremity are usually accompanied by itching, burning and aching,¹ relatively infrequently is the pain severe. Occasionally, however, patients with varicose ulcers are seen who complain bitterly of pain which is little affected by the usually successful therapeutic methods. Because we have secured such splendid results in these cases by the administration of vitamin B₁, this presentation is made.

For some time, in the Department of Surgery at Hutchinson Memorial Clinic of Tulane University, all patients with clinical and subclinical avitaminosis, persistent neuritis and painful chronic lesions have been given vitamin B₁ (thiamin, Betaxin). It was striking that patients with painful varicose ulcers were relieved shortly after the institution of the vitamin B₁ therapy.

Krieg² had previously (1938) reported results obtained with the use of thiamin. Of the thirty-five patients with varicose ulcers treated with thiamin alone, all but five experienced relief of pain. Four of the five had severe venous stasis and induration of the veins and surrounding areas. Pain, stiffness, heaviness and pressure usually were relieved from four to eight days after the institution of the treatment. When treatment was discontinued, the symptoms returned but in milder form. Krieg observed that in twenty-one cases there was a definite decrease in the size of the varicosities in that the veins, even the large ones, became smaller and that this decrease was visible as well as measurable. Merdinger³ also observed the beneficial effects of thiamin in relieving the symptoms of varicose ulcers but stated that the relief was of only short duration and did not occur in every case. He believed that better results were obtained when the vitamin was administered intravenously. Krieg⁴ in reply to Merdinger's report stated that according to his experience small oral doses were effective in relieving symptoms and, in fact, this method of administration was so satisfactory that the use of intravenous injections had been abandoned.

Of ten patients with painful varicose ulcers admitted to the Hutchinson Memorial Clinic and treated with vitamin B₁, all but one were definitely relieved and eight had complete subsidence of their symptoms. The length of time before the onset of relief varied from three to eleven days, with an average of five days. In two cases the symptoms completely subsided in four days. In the other six cases, disappearance of the symptoms was more gradual but progressive. In five of the ten cases there was, in addition to the relief of symptoms, definite improvement in the healing of the ulcer, although there had been more or less resistance to therapy prior to the vitamin administration. In two cases the discontinuance of the vitamin resulted in the recurrence of the pain but in a milder form. It was promptly relieved when the vitamin was again administered. One patient who had used sedatives for four years because of pain associated with her varicose ulcer has been completely relieved since the institution of the vitamin therapy. The one patient who had no symptomatic response had a large indurated and infected ulcer of four years' duration.

All the patients were women varying in age from 27 to 75 years. There was no correlation between the age of the patients and the onset of relief.

Patients were instructed as to diets relatively high in vitamin B₁ content, but as there were no means of checking these diets accurately the adequate intake of vitamin B₁ was assured by the administration of thiamin tablets in doses above the daily minimum requirement of 300 international units, or 1 mg.⁵ It is known that vitamin B₁ is stored in the body in small amounts, but until clinical tests are perfected by which the amounts stored can be determined quantitatively the adequate dose necessary for these patients can be determined only by the trial and error method. Rather early in our investigation it became evident that large doses of the vitamin B₁ were necessary to produce the desired

2. Krieg, E.: Die Beeinflussung des Krampfaderleidens durch Vitamin B₁. München, med. Wchnschr. 85:29 (Jan. 7) 1938.

3. Merdinger, Otto: Die Beeinflussung des Krampfaderleidens durch Vitamin B₁. München, med. Wchnschr. 85:500 (April 15) 1938; comment on Krieg.²

4. Krieg, E.: Rejoinder to Merdinger.³ München, med. Wchnschr. 85:560 (April 15) 1938.

5. Cowgill, G. R.: Human Requirements for Vitamin B₁. J. A. M. A. 111:1079 (Sept. 10) 1937.

From the Department of Surgery, School of Medicine, Tulane University of Louisiana.

1. Ochsner, Alton, and Garzide, Earl: Chronic Leg Ulcers. Texas State J. Med. 25:587 (Jan.) 1920.

results. At the present time investigations are being made concerning the relative values of oral and intravenous administration.

Krieg used daily intramuscular injections of from 5 to 10 mg. of thiamin until improvement was noted, then gave 1 mg. three times a day by mouth for a week, followed by a week's administration of 1 mg. twice daily, and then a week's administration of 1 mg. once daily.

It has been suggested by Goodhart and Jolliffe⁶ that the best results in the treatment of alcoholic neuritis were obtained by the use of large daily doses (as much as 50 mg. per day) rather than continued small doses. Weiss⁷ has shown that when no clinical improvement resulted from the use of small doses of vitamin B₁ in the treatment of alcoholic neuritis the use of larger doses brought about definite clinical results. These experiences, as well as our own, suggest that large doses of vitamin B₁ are necessary in order to relieve pain both in alcoholic neuritis and in varicose ulcer. At the present time we believe that at least 5 mg. (1,500 units) three times a day should be given patients with painful

Summary of Cases of Varicose Ulcers Treated with Thiamin

Case*	Age	Duration of Ulcer	Symptoms	Mg. of Thiamin per Day	Onset of Relief
1	75	2 weeks	Burning pain	3	5 days
2†	37	8 months	Itching, heaviness	3	11 days
3†	49	10 months	Pain	15	5 days
4	27	2 years	Cramping pain	15	4 days
5	41	3 months	Severe burning	3	5 days
6	65	1 month recurrent 24 years	Itching, heaviness	30	Some in 4 days
7	46	2 years recurrent 4 years	Pain	3	None
8	61	2 years	Pain	15	7 days
9	37	2 years	Burning pain	15	3 days
10	31	2 months	Severe pain	3	3 days

* All patients were women.

† Medication was discontinued temporarily with return of the original symptoms in a milder form. Symptoms ceased when medication was resumed.

varicose ulcers, and if the symptoms do not subside within three to four days the dose should be doubled.

There is no contraindication to the giving of large doses over prolonged periods. Experiments on animals have shown that enormous doses can be administered with no ill effects. However, lethal doses have been obtained in experiments on animals.

The explanation for the relief of pain associated with varicose ulcers when large amounts of vitamin B₁ are administered is not simple. Because of the inability to determine quantitatively the amount of vitamin B in the blood, one is unable to demonstrate a vitamin B deficiency. Because of prompt relief of pain following the vitamin administration, it is possible, however, that these patients did have a vitamin B₁ deficiency and that the relief was occasioned by correction of the deficiency. The vitamin deficiency may be due to inadequate supply, inadequate absorption or inadequate utilization of the vitamin in the diet. On the other hand, if the supply is normally adequate, the deficiency may be due to factors which require an abnormal amount to supply the body's needs.

6. Goodhart, R. S., and Jolliffe, Norman: Observations of the Effects of Vitamin B₁ Therapy on the Polyneuritis of Alcohol Addicts, *J. A. M. A.* **110**: 414 (Feb. 5) 1938.
7. Weiss, cited by Cowgill.⁵

RECOVERY IN AMYOTROPHIC LATERAL SCLEROSIS

TREATED WITH TOCOPHEROLS (VITAMIN E):
PRELIMINARY REPORT

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Amyotrophic lateral sclerosis is a chronic disease involving essentially the old and new motor systems, namely the anterior horn cells and the pyramidal tracts. The disease, which affects older adults and persons past middle age, is regarded as a degenerative one of unknown etiology. It is relentlessly progressive. It generally begins in the upper extremities with loss of power, atrophies and fibrillations, and when it ascends, as it generally does, to the medulla it terminates fatally. The duration is from one to two years, longer if the disease begins in the lower extremities. As far as is known there are no remissions, there is no treatment and there is no cure. The neurologic characteristic of the disease is a combination of paralysis and atrophy with increased deep reflexes. In every other disease in which the anterior horn cells are affected, the deep reflexes are invariably lost in the affected limb. In amyotrophic lateral sclerosis, because the pyramidal tracts are also involved, the reverse is true. Because of its insidious nature, the patient at first pays no attention to the disorder or is treated for a long time before it is recognized. This is the reason why the neurologist rarely sees early cases. When they come to him they are usually fairly well advanced. This is of great importance.

The following two cases are reported because they are the first instances within my personal knowledge in which amyotrophic lateral sclerosis has yielded to treatment.¹ The results of treatment have been so spectacular thus far that I am constrained to make this preliminary report. Experimental work on animals has shown that once the anterior horn cells are destroyed because of vitamin privation they cannot be repaired, and the degeneration is progressive. If, however, the condition is recognized early and treated promptly there is the possibility not only of arresting the process but of reversing it. This points to the need of treating amyotrophic lateral sclerosis in its early stages before irreversible damage is done.

The treatment of amyotrophic lateral sclerosis with vitamin E, more particularly the alpha-tocopherol factor, was undertaken with the following considerations in mind: It has been known for a long time² that the privation of vitamin E will cause atrophies and paralyses in young rats. The paralyses were observed in the course of experiments on sterility. More recently (1935) Ringsted³ reported on paresis in old rats suffering from chronic avitaminosis. A year later (1936) Lipshutz⁴ described degeneration of the nervous system as the result of privation of vitamin E. In 1937

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Read at a staff conference of the Mount Sinai Hospital, Jan. 8, 1940.

1. Since this work was done there has appeared an article by Franklin Bicknell entitled Vitamin E in the Treatment of Muscular Dystrophies and Nervous Diseases (*Lancet* **1**: 10-13 [Jan. 6] 1940) in which recovery is reported in two cases of amyotrophic lateral sclerosis, one of six years' duration. Essentially the article deals with the dystrophies, and mercuric is made of tales.

2. Evans, H. M., and Burr, G. O.: Development of Paralysis in the Suckling Young of Mothers Deprived of Vitamin E, *J. Biol. Chem.* **76**: 273-297 (Jan.) 1928.

3. Ringsted, Axel: A Preliminary Note on Appearance of Paresis in Adult Rats Suffering from Chronic Avitaminosis E, *Biochem. J.* **29**: 788-795 (March) 1935.

4. Lipshutz, D.: Les voies atteintes chez les jeunes rats manquant de vitamine E, *Rev. neur.* **65**: 221-233 (Feb.) 1936.

Burr, Brown and Moseley⁵ further reported on paralyzes in old rats on a diet deficient in vitamin E. In 1938 Einarson and Ringsted⁶ published their monograph on the effects of chronic vitamin E deficiency on the nervous system and on the skeletal musculature in old rats. They showed that the posterior columns and pyramidal tracts as well as the anterior horn cells and possibly those of the intermediolateral gray were affected in vitamin E privation. They raised several interesting practical and theoretical questions, among them the fact that the pyramidal tract in the rat is situated in the dorsal and not the lateral column of the spinal cord. What is pertinent to our discussion is that they demonstrated degeneration of the pyramidal tract and anterior horn cells and spoke of the analogy to amyotrophic lateral sclerosis in man.

While it was known that vitamin E privation can cause paralyzes of muscles, it was not known what the antisterility factor has to do with it. Einarson and Ringsted raised the question whether there was not also another factor, the privation of which caused degeneration within the nervous system. Thanks to the work of Evans and his collaborators,⁷ it has become known more recently that whole wheat germ oil contains alpha and beta tocopherols and that the alpha probably has to do with the muscular atrophy. It was at this point that I began treatment of amyotrophic lateral sclerosis with a synthetic preparation containing alpha-tocopherol.

REPORT OF CASES

CASE 1.—A. L., a man aged 52, an insurance agent, complained of loss of power in the left hand and tiredness of the legs. He was perfectly well up to the present illness, although he stated that he had had an occasional tingling feeling in the left forefinger and aches in the left scapular region for years. In July 1939 he began to have weakness of the left hand, the loss of power gradually becoming so marked that he practically lost the use of the hand. About a week or so before coming to the office, on Oct. 18, 1939, his legs began to tire. There were no other complaints: no fever, no visual disturbances, no gastrointestinal symptoms, no urinary disturbances, no loss of libido, no history of trauma, no major or even minor illnesses.

Neurologic examination was entirely negative except for the following: The biceps, triceps and wrist jerks were much more active on the left than on the right, the left knee jerk was greater than the right and the left abdominals were weaker than those on the right, but the ankle jerks were equal and there were no pathologic reflexes. The left plantar reflex was not present. There was marked weakness of the fingers of the left hand, partial left wrist drop, and weakness of the muscles of the forearm and shoulder girdle. There was marked atrophy of the small muscles of the hand, the interossei and the thenar and hypothenar eminences. The paresis was flaccid. A few fibrillations were seen occasionally in the left arm and shoulder muscles. There were no sensory disturbances. The cerebral nerves were entirely normal. There was asymmetry of the facies with slight lagging of the left corner of the mouth, actually of no significance as the patient had it all his life.

The patient had been receiving vitamin B therapy with no effect. He was admitted to the Mount Sinai Hospital, where all the neurologic observations were confirmed. The serologic reactions were negative. The spinal fluid was normal and there was no block. The blood was normal. X-ray examination of the skull, chest and cervical spine showed no patho-

logic condition. The electrical reactions, despite the marked atrophies, were not conclusive. A short time before coming to the hospital the patient was given whole wheat germ oil. As soon as studies were completed he was given two tablets of ephynal, 3 mg. each, three times a day. Improvement began almost immediately. After a few weeks the patient regained sufficient power to button his coat, make his tie and use his hand in eating. The wrist drop began to clear up. Once he ran out of the medication and did not take the tablets for three days. Weakness began to return, but immediate recovery set in once more on resumption of treatment. Four weeks later I purposely stopped the administration of the tablets for five days and again the weakness returned, only to disappear as soon as the tablets were readministered. At present he has good power in his hand, and the interosscous spaces and the thenar and hypothenar eminences are beginning to fill out.

CASE 2.—C. B., a woman aged 36, a housewife, was admitted to the hospital in August 1939 with the complaint of weakness in both arms and legs of one year's duration. At first there was difficulty in walking; soon the hands and arms became so weak that she could not feed herself; much later dryness of the throat and difficulty in swallowing set in. There were no visual disturbances, no impairment of urinary function and no other complaints. For years the patient had eaten few green vegetables.

The positive neurologic observations were fibrillations in the muscles of the extremities, trunk and tongue, and marked atrophy and loss of power in the muscles of the hands, feet, and tongue and some of the arms and legs. All the deep reflexes were hyperactive and there was bilateral clonus. The spinal fluid, including dynamics, was normal, and so were the blood chemistry and the serologic reactions. X-ray examination of the spine was negative. There was no doubt of the diagnosis of amyotrophic lateral sclerosis.

The patient was given vitamin B and a diet fairly rich in all vitamins. Within one month she appeared to feel subjectively better and the fibrillations seemed less. In October she was given the tocopherol acetate, three tablets of 3 mg. each in addition to the vitamin B. The difficulty in swallowing gradually subsided by the time of her discharge in November. When seen one month and two months later, the atrophy and fibrillations of the tongue had disappeared and her general strength increased to the extent that from being confined to bed she could walk with assistance; indeed she returned to the follow-up clinic of the hospital.

COMMENT

Although only two cases are cited, the prompt response to vitamin E, namely the synthetic tocopherols, seems to me to be of unusual significance. It is of great importance that full recovery occurred in an early case and that the atrophy of the tongue, which was the youngest symptom in the older case, yielded soonest. Trial in three other cases in which the condition is very far advanced have thus far yielded no results; in a fourth there seems to be some recovery of muscle power. This is in accord with what has been observed in experimental animals. Of even greater significance is the fact observed on two occasions, when the administration of the tocopherols was stopped, that the weakness returned, and, when treatment was resumed, recovery promptly resulted. This is almost a crucial physiologic and clinical experiment indicating that the recovery was the direct result of the treatment.

There are a few theoretical questions worth considering. One is the fact that aside from the pyramidal tract and anterior horn degeneration there is also involvement of the posterior sensory columns in the experimental animals of Einarson and Ringsted. Posterior column degeneration does not as a rule occur in amyotrophic lateral sclerosis, but it so happens that I

5. Burr, G. O.; Brown, W. R., and Moseley, R. L.: Paralysis in Old Age in Rats on a Diet Deficient in Vitamin E. *Proc. Soc. Exper. Biol. & Med.* 46:780-782 (June) 1937.

6. Einarson, Lårus, and Ringsted, Axel: Effect of Chronic Vitamin E Deficiency on the Nervous System and the Skeletal Musculature in Adult Rats. Copenhagen, Levin & Munksgaard, London, Oxford University Press, 1938.

7. Evans, H. M.: New Light on the Biological Role of Vitamin E (references). *J. Mount Sinai Hosp.* 6:233 (Jan.) 1940 (the Welch Lecture, October 1939).

8. Wechsler, I. S., and Dawson, Charles: Amyotrophic Lateral Sclerosis with Posterior Column Involvement and Various Sensory Disturbances. *Arch. Neurol. & Psychiat.* 55:229-239 (Feb.) 1936.

reported cases in which there was posterior column involvement. Another point is that the pyramidal tract in rats is not quite comparable to the pyramidal tracts in man. It would therefore be necessary to try vitamin E privation in higher animals, particularly the macacus. Experiments are being undertaken with monkeys deprived of vitamin E, and treatment with wheat germ oil and synthetic tocopherols will be instituted.

There seems to be good evidence of the relation of vitamin E privation to the dystrophies. The muscle degeneration in dystrophy differs from the atrophy which is secondary to loss of anterior horn cells. It is possible, in view of the disappearance of cells from the intermediolateral horns of the cord, that the trophic sympathetic nerves may have something to do with the dystrophies. In any case treatment of the dystrophies with vitamin E is definitely indicated in the hope of curing early cases and arresting old ones.

Although the relapse in case 1 after withdrawing the synthetic vitamin E and the prompt recovery after readministering it is almost absolute proof of the efficacy of the treatment, more cases will have to be treated before final answer can be given. The treatment is now being carried out on a large series and further reports will be made. It is of interest, first, that ordinary good diet may be deficient in vitamin E, that some persons for various reasons do not partake of those articles of diet which are rich in vitamin E, and that some individuals have gastrointestinal disturbances before the advent of the disease. This points to the probability of malabsorption despite adequate vitamin E in the diet. Indeed one patient gave a history of abdominal distress and restricted diet for a year preceding the onset of the illness. This parallels more or less the condition in vitamin B privation, which results in neuropathies. It will therefore be necessary to obtain good dietary histories in every case, particularly as to likes and dislikes of foods. This too is being carried out in the new cases under observation.

In view of the fact that there is or seems to be poor absorption from the gastrointestinal tract in cases of amyotrophic lateral sclerosis and that one cannot in any event gauge the amount that is absorbed, the need of administering vitamin E parenterally becomes extremely important. One can now inject the tocopherol in oil intramuscularly, and in the new group of cases injections will be given in addition to feeding of synthetic vitamin E and whole wheat germ oil. Comparative results will be reported as soon as they are available.

CONCLUSION

I would not be understood to say that the absence of vitamin E alone is the cause of amyotrophic lateral sclerosis. There is a theoretical possibility that it is, but we have as yet no proof. It is quite possible that other unknown factors play additional etiologic roles. All one can say is that in one case of amyotrophic lateral sclerosis complete recovery was brought about by the administration of tocopherols, and in another there was marked improvement. I should add that although the patients were also given vitamin B they did not show recovery and that other patients to whom shotgun prescriptions of the A, B, C and D vitamins were administered did not respond. Experimental animals treated with the vitamin B alone also failed to respond. But there is some reason to believe that the added administration of vitamin B may aid the vitamin E in treatment.

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THE HOUSSAY PHENOMENON IN MAN

REPORT OF A CASE OF DIABETES MELLITUS,
INFARCT OF THE ANTERIOR LOBE OF
THE PITUITARY BODY AND TER-
MINAL HYPOGLYCEMIA

J. H. KOTTE, M.D.

AND

A. R. VONDERAHE, M.D.

CINCINNATI

The regulation of carbohydrate metabolism by certain endocrine glands, notably the pancreas and the hypophysis, has been known for some time, but the complex interrelationship between them is as yet imperfectly understood. The antagonism between the pancreas and the hypophysis is perhaps the best appreciated phase of this activity; however, certain other endocrine glands, notably the thyroid and the adrenal glands, also have a regulatory effect on carbohydrate metabolism. The internal secretion of the pancreas is known to be antidiabetic and to aid in some manner the utilization of dextrose by the tissues; the anterior lobe of the hypophysis, however, possesses a diabetogenic or gluconeogenic principle. It was Houssay's¹ publications on the close relationship between the pancreas and the hypophysis that served to stimulate the accumulation of a great mass of experimental data, most of which supports his work.

The Houssay phenomenon refers to (1) the hypersensitivity of hypophysectomized animals to insulin and (2) the virtual disappearance after hypophysectomy of the diabetes induced by depancreatization. Animals with both pancreas and hypophysis removed are found to live longer than ordinary depancreatized animals, apparently because of the relatively normal level of dextrose in the blood, complete absence of ketosis, more normal respiratory quotients and reduction of excessive consumption of nitrogen stores.²

Hypoglycemic episodes occur often in diabetic hypophysectomized animals, especially during fasting, and such animals may die in an attack of hypoglycemic crisis. If sugar is given, recovery is usually spectacular but the hypoglycemic crisis recurs unless feeding is maintained. Hypoglycemia in these animals can be prevented if injections of anterior pituitary extracts are given. Hypoglycemic crises may occur as well in nondiabetic hypophysectomized animals, but only when they are kept in a fasting state. Well fed nondiabetic hypophysectomized animals, on the other hand, usually have normal blood sugar levels and carbohydrate reserves.

From these facts it is obvious that the pituitary has a regulatory effect on the blood sugar and is concerned with its maintenance during fasting. At present, two theories are advanced to explain this action: (1) the anterior lobe regulates the available dextrose by stimulating its formation from endogenous protein and possibly from fat, and (2) the anterior lobe regulates carbohydrate oxidation by some stimulating-inhibiting effect.

From the University of Cincinnati College of Medicine and the Cincinnati General Hospital.

1. Houssay, Bernardo: The Hypophysis and Metabolism (Dunkerton Lecture, Harvard), New England J. Med. 214: 961 (May) 1936.

2. Russell, Jane A.: Relation of Anterior Pituitary to Carbohydrate Metabolism, Physiol. Rev. 18:1 (Jan.) 1938.

In considering the material just presented it should be mentioned that more recently Long and Lukens³ have produced effects very similar to those obtained by hypophysectomy by complete removal of the adrenal glands in diabetic animals. They consider that hypophysectomy alleviates diabetes by provoking adrenal hypofunction.

While these effects have often been described in a variety of experimental animals, they have rarely been observed in man. Decreased tolerance for sugar has been noted in Cushing's syndrome and in acromegaly associated with hyperplasias of the pituitary body. On the other hand, increased tolerance to dextrose is seen in the destructive or atrophic lesions of the pituitary body, classified clinically as Simmonds' disease.⁴ Here the destruction of glandular tissue causes an apparent diminution in the diabetogenic hormone due to what Simmonds considered embolic occlusion of the end arteries of the anterior lobe or to what others have shown to be thrombosis, tuberculosis, metastatic cancer, gumma or abscess. If the destruction occurs suddenly and massively, death may occur before the typical symptoms of Simmonds' disease can occur. Such patients have low blood sugar levels, similar to the low blood sugar level in the hypoglycemic crisis of an experimental animal, and exhibit a general slowing of most physiologic activities. Many case reports, substantiated by postmortem observations, can be found in the literature, some presenting a picture of acute necrosis of the gland similar to that reported here. These are summarized in reports by Calder⁵ and by Silver.⁶

Reports of cases in man duplicating Houssay's phenomenon are definitely rare. Lyall and Innes⁷ in 1935 reported a case of severe diabetes mellitus which was ameliorated by a lesion of the pituitary body and which finally became sensitive to insulin but showed no spontaneous hypoglycemia. Some authors⁸ have attempted roentgen therapy to the hypophysis in diabetes mellitus. Chabanier and his associates⁹ reported a case of severe diabetes in which they did an ablation of the anterior lobe of the pituitary body in an effort to effect a cure. Prior to operation the blood sugar averaged 400 mg. per hundred cubic centimeters and the patient took from 150 to 170 units of insulin a day with a carbohydrate intake of only 80 Gm. a day. After removal of the pituitary body the blood sugar ranged between 75 and 220 mg. per hundred cubic centimeters and the diabetes generally improved. However, the patient's quiescent pulmonary tuberculosis became reactivated, after which the dextrose tolerance again decreased and death occurred five months after the operation.

The following case illustrates some of the phenomena described in experimental animals and may be regarded as an example in the clinic of the "Houssay animal":

3. Long, C. N. H., and Lukens, F. D. W.: Effects of Adrenalectomy on Diabetes in Cats, *J. Exper. Med.* 57: 3 (Feb. 1935); Observations on Cats Science 70: 569 (June 1934); Observations upon Hypophysectomized, Depancreatized Cats, *Proc. Soc. Exper. Biol. & Med.* 32: 326 (Nov.) 1934.
4. Simmonds, Morris: Ueber Hypophysisschwund mit tödlichem Ausgang, *Deutsche med. Wchnschr.* 40: 322, 1914; Ueber Kachexie Hypophysären, *Deutsche med. Wchnschr.* 42: 190, 1916; Atrophie des Hypophysären und hypophysäre Kachexie, *München. med. Wchnschr.* 63: 441, 1916.
5. Calder, R. M.: Anterior Pituitary Insufficiency (Simmonds' Disease), *Bull. Johns Hopkins Hosp.* 50: 87 (Feb.) 1932.
6. Silver, Solomon: Simmonds' Disease (Cachexia Hypophysæica): Report of Case with Postmortem Observations and Review of Literature, *Arch. Int. Med.* 51: 175 (Feb.) 1933.
7. Lyall, Alexander, and Innes, J. A.: Diabetes Mellitus and the Pituitary Gland: A Case of Diabetes with Intercurrent Pituitary Lesion and Concurrent Improvement of Diabetes, *Lancet* 1: 318 (Feb. 9) 1935.
8. Dobrin, Max, and Lucinian, H. H.: Diabetes Treated by Irradiation of Hypophysis, *J. Florida M. A.* 21: 550 (June) 1935.
9. Chabanier, Henri, Puch, P., Lobo-O'Neill, C., and Lelu, E.: Hypophyse et diabète (à propos de l'ablation d'une hypophyse normale dans un cas de diabète grave), *Presse méd.* 44: 986 (June 10-17) 1936.

REPORT OF CASE

History.—A white man aged 40, unmarried, was admitted to the Cincinnati General Hospital at 6 p. m. Oct. 10, 1938, in a semistuporous condition. The history was difficult to obtain but was supplemented by information from his relatives.

The patient was reticent and unsocial. He lived alone and had few friends and intimates. When in Ireland, five years before admission to the hospital, a diagnosis of diabetes mellitus was made. He followed no rigid, planned diet thereafter but eliminated certain foods on a qualitative and quantitative basis. He was known to test his urine regularly and took insulin more as the need arose than on a definite schedule.

About two months before admission he complained of loss of weight and of weakness, and a short time later of pain in the left side of the chest accompanied by a chronic cough with expectoration, night sweats and easy fatigability. He refused to stop work despite increase in severity of his symptoms.

Two weeks prior to admission he noted a generalized headache, which after a week became so severe that he was taken to his uncle's home. During the two days spent there he was excessively weak and lethargic and coughed frequently; swelling of the ankles was noted. However, at the end of this time he insisted on walking about three miles back to his room and returned to work. Three days before admission he was forced again to go to his uncle's home, where he remained in bed con-

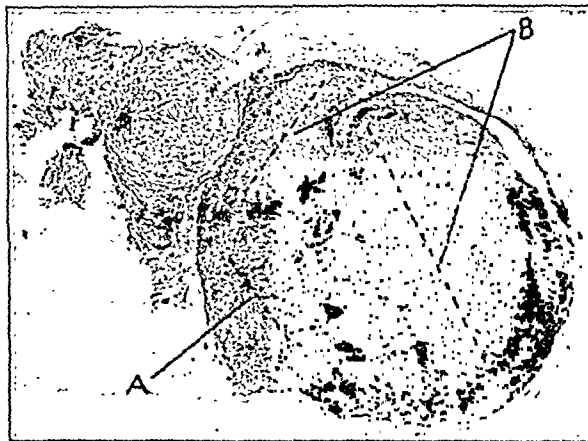


Fig. 1.—In this sagittal section through the pituitary body, A represents approximately normal glandular tissue and B represents an infarct of the anterior lobe with extensive areas of necrosis. Hematoxylin-eosin stain. Reduced from a photomicrograph with a magnification of 15 diameters.

stantly. At this time he tested his urine and it was noted that the blue solution changed to a yellowish color. Extreme weakness, sweating and restlessness were outstanding symptoms. His appetite was only fair, and he ate only a few eggs, bread and lamp chops during the three days preceding admission; during this time, however, it is definitely known that he took no insulin. Dr. J. P. Bencke saw him on the day before admission and found that his urine contained an excessive amount of sugar. On the morning of the day of admission he appeared much worse than on the preceding day. There were pallor, sweating, urinary incontinence and such excessive weakness that he could not talk above a whisper. Because of his precarious condition he was referred to the Cincinnati General Hospital.

Physical Examination.—The patient was emaciated. He was semistuporous, perspired freely and lay quietly in bed without much complaint. The temperature was 102.8 F., pulse rate 98, respiratory rate 25 and blood pressure 108 systolic, 50 diastolic. Over the legs there were a few reddish macular areas of irregular outline about 1 cm. in diameter, not fading on pressure. The pupils were equal and reacted to light. Ophthalmoscopic examination revealed no abnormalities.

The trachea was in the midline. The thorax was of the long, thin type, with moderate pigeon breast deformity of the upper part of the sternum. Respirations were feeble, shallow and equal. Resonance was impaired over both apexes, with dullness in the left interscapular area. Many rhonchi were heard bilaterally. There were constant fine rales over the upper lobe of the

left lung posteriorly and also over the base of the right lung. The breath sounds were somewhat increased over the entire left side of the chest. The heart was not enlarged. Its rhythm was regular and there were no murmurs. All pulses were equal but of poor volume. The abdomen was level with the chest, was lax, and moved freely with respirations. No masses or tenderness was found. The liver, spleen and kidneys were not palpable. The rectal examination disclosed a normal con-



Fig. 2.—In this higher magnification *A* represents the margin of the infarct and *B* the necrotic portion of the infarct. Hematoxylin-eosin stain. Reduced from a photomicrograph with a magnification of 100 diameters.

dition. A small amount of edema of the ankles could be demonstrated. There was no cyanosis of the extremities or clubbing of the fingers. The neurologic examination showed normal status as far as the patient's cooperation permitted testing.

Laboratory Data.—Examination of the blood revealed the following values: hemoglobin 11.3 Gm., red cell count 3,330,000, white cell count 8,800 with 84 per cent neutrophils, 1 per cent eosinophils, 1 per cent basophils and 14 per cent lymphocytes. The platelets were normal in amount. A specimen of urine obtained by catheterization presented a specific gravity of 1.018 and contained no albumin, sugar, acetone or abnormal microscopic elements. The stool was normal. The sputum was purulent and contained moderate numbers of tubercle bacilli. The Kahn reaction in the blood was negative. Tests of blood sugar and carbon dioxide combining power were made on admission but not reported as emergency procedures because of a normal picture on urinalysis. A spinal tap showed normal pressure and normal cytologic and serologic features. The cerebrospinal fluid protein was 12 mg. and the chlorides 636 mg. per hundred cubic centimeters.

Course.—The patient remained in a semistuporous state during his eighteen hours in the ward. The temperature rose to 104 F., the pulse rate fell sharply to 75 and later to 60 and the respiratory rate remained between 20 and 30. Terminally, cyanosis of the extremities became apparent, and death took place without any other appreciable change.

Reports on the blood chemistry were returned a few hours after death. The blood sugar level was 31 mg. per hundred cubic centimeters on admission and the carbon dioxide combining power 58 volumes per cent. The urea nitrogen was 19 mg. per hundred cubic centimeters. Twelve hours later the blood sugar was less than 20 mg., a figure too low to be accurately read by Folin's method. The spinal fluid sugar similarly was less than 20 mg.

The patient was thought to have far advanced pulmonary tuberculosis, tuberculous pneumonia and hypoglycemia of undetermined origin.

Postmortem Observations.—An autopsy was performed by Dr. Sabro Tashiro eight hours after death. The body was well developed and poorly nourished. There was clear straw-

colored fluid in the right and left thoracic cavities. There were numerous nodular areas presenting caseation and cavitation throughout both lower lobes and the left upper lobe of the lungs. Examination of the gastrointestinal tract revealed acute ileitis with focal fibrino-purulent peritonitis. On microscopic examination the lungs presented a picture of miliary tuberculosis. There was also microscopic evidence of toxic myocardiosis and chronic passive congestion of the liver. On microscopic examination of tissue from the kidneys, in addition to toxic nephrosis, vacuolation of the cells of the loops of Henle was noted, a change encountered in cases of diabetes mellitus. Gross and microscopic examination of the pancreas and both adrenal glands (fig. 3) revealed no abnormalities. The pituitary gland presented no gross abnormalities. On microscopic examination of the pituitary gland there was noted an area of partially disintegrated, very pale staining cells implicating the entire anterior lobe except for a few normal glandular cells along some portions of the periphery (figs. 1 and 2). In the border of the ischemic area the capillaries were filled with blood and there was some extravasation of blood. In scattered areas throughout the ischemic area, nuclear fragments were found. The pars intermedia and pars nervosa were not affected, although the blood vessels in these portions of the gland revealed a moderate degree of congestion. A diagnosis of massive infarction with necrosis of glandular tissue of the anterior lobe of the pituitary gland was made.

Gross examination of the brain after fixation in solution of formaldehyde revealed cerebral congestion and moderate cerebral edema. Microscopic examinations of serial sections through the diencephalon revealed an excessive amount of glial proliferation throughout the hypothalamus but especially intense in the paraventricular nucleus and nucleus supra-opticus. Both of these nuclei presented very advanced retrograde changes in the neuron cell bodies with frequent evidence of shadow cells and cell death. There was intense vascular congestion throughout the anterior hypothalamus with some areas of extravasated blood in the subependymal area in the region of the hypothalamic sulcus. There was a pronounced subependymal gliosis.

COMMENT

This diabetic patient was, in effect hypophysectomized and he died in acute hypoglycemia. Lacking other objective knowledge, we have the following evidence that he was diabetic: (1) A diagnosis of diabetes



Fig. 3.—The normal adrenal gland. Hematoxylin-eosin stain. Reduced from a photomicrograph with a magnification of 100 diameters.

mellitus was made in an Irish hospital and was followed by regular urinalysis for sugar, (2) marked glycosuria was noted by his physician as late as thirty-two hours before admission, (3) used and unused insulin and syringes were found among his belongings after death, and (4) glycogenic degeneration of the loops of Henle was found on microscopic examination of tissue from the kidneys.

The necrotic process involving the anterior lobe of the pituitary gland has been demonstrated. The pathologic picture suggests a very recent occurrence because of a lack of organization and because of the very slight amount of cellular reaction. The cause of the infarction remains a matter of speculation. The history indicates that a necessary factor for hypoglycemia, namely fasting, was present. The poor intake of food preceding death, plus the added burden of infection, probably lowered the glycogen stores to a pronounced degree. At the time of death the patient's blood probably contained no sugar, since levels around 20 mg. per hundred cubic centimeters are thought to be due to other reducing substances in the cells, especially glutathione. It is interesting to note that the patient showed no convulsive phenomena associated with the extreme hypoglycemia.

SUMMARY

A patient with diabetes mellitus of five years' duration had severe terminal hypoglycemia. Autopsy revealed an infarct of the pituitary body with destruction of the anterior lobe. The case was complicated by acute ileitis, localized purulent peritonitis and pulmonary tuberculosis. The evidence presented appears to justify the conclusion that the case represents one of the few recorded examples of the Houssay phenomenon in man.

Clinical Notes, Suggestions and New Instruments

THE NATURE OF THE RENAL LESION WITH SULFAPYRIDINE THERAPY

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Although the gross presence of urinary calculi as a consequence of sulfapyridine therapy has been reported both experimentally and clinically,¹ no calculi have been seen in microscopic preparations. The most constant finding in the microscopic examination of the kidneys in the reported postmortem examinations has been marked dilatation of both convoluted and collecting tubules and of the glomerular spaces. The cause and nature of these lesions have not been demonstrated, how-

ever. The calculi and the associated disturbances in renal function constitute the most disturbing complication of the use of sulfapyridine and, as stressed by Bensley,² measures designed to prevent such a complication cannot be adequately determined until more is known of its cause. In the case reported here calculi, present grossly, were likewise demonstrable in the histologic preparations of the kidneys, and the etiology of the described cortical lesions could be determined.

REPORT OF CASE

A child aged 5 months was admitted to the Illinois Central Hospital, in the service of Dr. Everett Laury, Oct. 19, 1939, with symptoms of meningitis. Spinal fluid on examination revealed pneumococcus type VIII, and on the day after admission sulfapyridine therapy was initiated in addition to the use of polyvalent antiserum. The first three days 52½ grains (3.4 Gm.) of the drug was given. During the four weeks the child was in the hospital a total of 44.2 Gm. of sulfapyridine was administered. Ten days after the initial dose gross hematuria appeared and was constantly present thereafter. Sulfanilamide

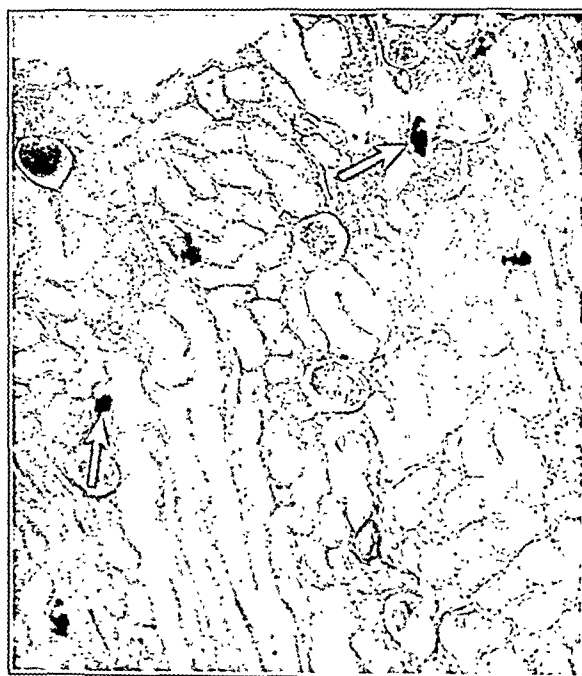


Fig. 1.—Section of cortex of kidney, showing numerous calculi in tubules (indicated by arrows) and dilatation of tubules and glomerular spaces. Slightly reduced from a photomicrograph with a magnification of 110 diameters.

From the Illinois Central Hospital and the Department of Pathology, University of Chicago.

1. These reports include:

- Antopol, William, and Robinson, H.: Urolithiasis and Renal Pathology After Oral Administration of 2(Sulfamylamino)Pyridine (Sulfapyridine), *Proc. Soc. Exper. Biol. & Med.* **40**: 428 (March) 1939.
Brown, W. H.; Thornton, W. B., and Wilson, J. S.: Observations on the Absorption, Distribution and Excretion of Sulfapyridine, *Dagenan or M.* & B. **693**, *J. Clin. Investigation* **18**: 803 (Nov.) 1939.
Gross, Paul; Cooper, F. B., and Lewis, Marion: Urinary Calculi Caused by Sulfapyridine, *Urol. & Cutan. Rev.* **43**: 299 (May) 1939.
Kilgour, J. M.: The Treatment of Pneumococcal Pneumonia with Sulfapyridine (Dagenan), *Canad. M. A. J.* **41**: 445 (Nov.) 1939.
Long, P. H., and Wood, W. B., Jr.: Observations on the Experimental and Clinical Use of Sulfapyridine: II. The Treatment of Pneumococcal Pneumonia with Sulfapyridine, *Ann. Int. Med.* **13**: 487 (Sept.) 1939.
Pepper, D. S.; Flippen, H. F.; Schwartz, Leon, and Lockwood, J. S.: Results of Sulfapyridine Therapy in 400 Cases of Typhoid Pneumococcal Pneumonia, *Am. J. M. Sc.* **108**: 22 (July) 1939.
Plummer, Norman, and Ensworth, H. K.: Sulfapyridine in the Treatment of Pneumonia, *J. A. M. A.* **113**: 1847 (Nov. 18) 1939.
Smith, E.; Evelyn, K., and Nolan, J.: Anuria Caused by Sulfapyridine Therapy, *Canad. M. A. J.* **42**: 27 (Jan.) 1940.
Smith, F. J., and Needles, R. J.: Report of Fifty Cases of Acute Lobar Pneumonia in Adults Treated with Sulfapyridine, *Am. J. M. Sc.* **108**: 19 (July) 1939.
Southworth, Hamilton, and Cooke, Crispin: Hematuria, Abdominal Pain and Nitrogen Retention Associated with Sulfapyridine, *J. A. M. A.* **112**: 1820 (May 6) 1939.
Tsao, Y. F.; McCracken, Mary E.; Chen, Ji; Kuo, P. T., and Dale, C. L.: Renal Complications in Sulfapyridine Therapy, *J. A. M. A.* **113**: 1316 (Sept. 30) 1939.
Bensley,²
Hofes, Gimbel and Burnett.³

was given for two days with a total dosage of 28 grains (1.8 Gm.). On November 11, examination revealed 8.7 mg. of sulfapyridine per hundred cubic centimeters of blood. Urine studies were not made during the last few days of life because of the difficulty in getting sufficient urine for analysis. The patient died on November 16.

At autopsy the diagnosis of persisting pneumococcal meningitis was confirmed. The kidneys were greatly enlarged, weighing 85 Gm. each, as compared with a normal average weight of 25 Gm. for the age of the patient. The cut edges bulged markedly. In the calices and pelvis of both kidneys there was a small amount of yellow-white gravel; from the pelvis of the right kidney four calculi measuring up to 1.5 mm. in diameter were isolated. Neither the pelvis nor the ureter was dilated. In both ureters and in the urinary bladder there was gravel similar to that in the kidneys; this was most prominent at the entrance of the ureters into the bladder. The mucosa of the urinary tract appeared normal.

2. Bensley, F. H.: The Toxic Effect of Sulfanilamide and Related Compounds, *Canad. M. A. J.* **42**: 30 (Jan.) 1940.

Sections of the kidneys were prepared by a "rapid" celloidin technic as well as by the usual slower celloidin method. The sections prepared by the former method showed numerous basophilic crystals and other structures in the tubules of the kidney, as described later. In most of the sections prepared by the usual celloidin method, however, no such material was visible, and the appearance was essentially that described in previous reports. The chief difference in the two methods was in the length of time the tissue was in contact with water or dilute solutions, either in the washing of the tissues or in the concentrations of the stains. In an attempt to determine whether the loss of the material in sections might be due to its solution by water, sections of a portion of tissue which exhibited numerous calculi by the rapid relatively anhydrous technic, when examined after contact with water for twenty-four hours, showed a marked quantitative reduction in the amount of the precipitated material in the tubules. In view of these results it appears possible that earlier failure to demonstrate calculi might have been due to the use of techniques which dissolved the material. Experimental work to determine the relation of the calculi to the solvent is in progress.

In all the sections there was a marked dilatation of both convoluted and collecting tubules in the cortex, with only occasional dilatation of the tubules in the pyramids. There was also dilatation of Bowman's spaces, with compression of glomerular tufts. These dilatations indicated that the collecting tubules were obstructed. The dilated tubules contained large amounts of basophilic and eosinophilic material present in the form of single or aggregated spherules. The amount of distention of the tubules, as well as the method of preparation of the sections, did not permit accurate identification of each tubule, but the material appeared to be present in both the convoluted and the collecting types. In the medullary rays many of the loops of Henle and the smaller collecting tubules were completely



Fig. 2.—Section of pyramid of kidney, with plugging of loops of Henle and small collecting tubules by basophilic material. Slightly reduced from a photomicrograph with a magnification of 430 diameters.

plugged by the foreign material. This material, both here and in the cortex, was of varying structure. There were many sharp edged basophilic crystals, amorphous basophilic debris and numerous discoid bodies composed of homogeneous material chiefly eosinophilic but occasionally appearing to be a mixture of eosinophilic and basophilic matter. In the washed sections the location of these discoid structures was indicated by eosinophilic bodies of similar form having the appearance of skeletons of

the homogeneous masses from which some of the material had been dissolved. These were presumably the protein stroma of the minute globules. In sections prepared from a large block by the usual technic the kidney pelvis contained basophilic masses with rarefied centers. The walls of these masses were bordered by radiating basophilic needles.

Chemical analyses of the concretions in other cases have revealed that they consist chiefly of acetylsulfapyridine and free sulfapyridine. Marshall³ has explained the formation of the



Fig. 3.—Section of calyx of the kidney, with basophilic mass. The center is rarefied; the walls are formed by radiating basophilic needles. From a section prepared by the usual technic. Reduced from a photomicrograph with a magnification of 360 diameters.

crystals as a probable precipitation in the tubules of the kidney as the urine becomes more concentrated. This theory would seem to be supported by the observations made in this case. The material is apparently precipitated in the proximal portions of the tubules, collects in the loops of Henle and the smaller collecting tubules and causes plugging of these excretory ducts. The result of this is the marked dilatation of the tubules and glomerular spaces previously described in other reports. This appearance is in contrast to the more common formation of calculi at the tips of collecting tubules, which causes marked dilatation of the tubules in the medulla and less distention of the cortical elements. It has been suggested³ that the extent of serious or permanent interference with renal function would depend on the fact that the precipitation of the acetylsulfapyridine was so extensive as to produce blockage of the tubules. Such a process has been demonstrated here and, although complete blood chemistry studies were not made in this case, marked retention of nitrogen has been shown to occur in other cases presenting hematuria and the formation of urinary crystals after treatment with sulfapyridine. Attempts to prevent this complication apparently must be based on practices designed to prevent the precipitation of the crystals. Two precautions have been used. The solubility of acetylsulfapyridine is reported to be less in acid than in alkaline mediums,³ and hence alkalization of the urine, chiefly by the use of sodium bicarbonate, has been used. The efficacy of this technic is still being determined. Use of large amounts of fluids to prevent concentration of the urine has apparently been successful in several cases, and there is some indication that such a procedure may wash out material previously present. In view of the site of the renal changes, as demonstrated in this case, such a practice would seem to be advisable.

SUMMARY

Precipitation of acetylsulfapyridine in the kidney was found at autopsy of a patient after treatment with sulfapyridine. The marked dilatation of cortical tubules and glomerular spaces characteristic of kidneys in cases of sulfapyridine toxicity seems to depend on intratubular precipitation of the drug or its compounds. There is a possible explanation for the previous difficulty in demonstrating the material in histologic sections.

3. Marshall, E. K., Jr., cited by Hodes, H. L.; Gimbel, H. S., and Burnett, G. W.: Treatment of Pneumococcal Meningitis with Sulfapyridine, *J. A. M. A.* 113: 1614 (Oct. 23) 1939.

AURICULAR FIBRILLATION OBSERVED FOR
TWENTY-FIVE YEARSLOUIS FAUGERES BISHOP, M.D., AND LOUIS FAUGERES
BISHOP JR., M.D., NEW YORK

Our primary reason for reporting this case is to illustrate what can occasionally be accomplished in auricular fibrillation.

REPORT OF CASE

History.—A woman aged 55 came to our office on Dec. 17, 1914, complaining chiefly of palpitation and dyspnea on exertion. Her past and family histories were not significant.

At the time of this examination her pulse rate was noted to be 130; the blood pressure was 130 systolic, 105 diastolic. A polygram done at this time indicated that the patient had auricular fibrillation. The auricular fibrillation was studied between the years 1914 and 1939, covering a period of twenty-five years. She was observed at fairly regular intervals.

The auricular fibrillation was first treated in 1914 with an infusion of digitalis. Later in 1916 she began to take doses of powdered leaves varying between 2 and 3 grains (0.13 to 0.2 Gm.) daily and continued it for the remainder of her life, which was for twenty-three years. An estimate of the amount of digitalis consumed between 1914 and 1939 would be $3\frac{1}{4}$ pounds.¹

During observation, 1914-1923 inclusive, her activities were normal. Her blood pressure was 150 systolic, 90 diastolic. The ventricular rate was approximately 90. Her digitalis



Fig. 1.—One of forty-three polygrams taken with the Mackenzie polygraph showing absence of the A wave in the jugular pulse and the irregular radial pulse (done in 1914).

dosage was $1\frac{1}{2}$ grains (0.1 Gm.) a day, except for one brief period when she omitted it, when it was necessary for a short time to increase it to 3 grains.

The only signs and symptoms noted were slight swelling of the ankles and numbness of the right arm.

In 1931 mild congestive failure was noted as evidenced by moist rales at the left base, which improved when her digitalis

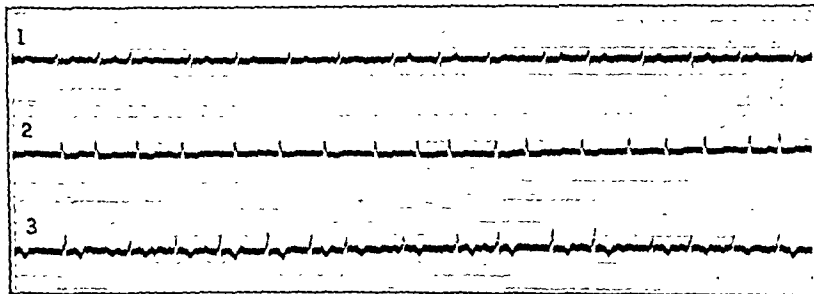


Fig. 2.—Tracing done May 26, 1919.

dosage was increased. Again in 1932 moist rales were noted at both bases, as well as a slightly tender liver. Digitalis dosage was now 2 grains a day. Her blood pressure had risen to 180 systolic and 80 diastolic. During February and March 1934 marked congestive failure gradually developed, and in March 1934 dehydration therapy was begun, which was continued up to the time of her death in September 1939.

In addition to the continuous use of digitalis, ammonium chloride was employed. Over this period she received several types of mercurial diuretics, including the salyrgan types; the

salyrgan was given for the most part intramuscularly and the mercurpurin intravenously. Mercurial diuretics were administered a total number of forty-six times in doses of from 1 to 3 cc.

Abdominal ascites became a great problem toward the end of her life, and in addition to mercurial diuretics it was necessary to do six abdominal paracenteses.

The woman's death occurred rather suddenly in September, four days after her last paracentesis and her last mercurpurin injection. She had a chill and elevation of temperature and went rapidly into coma, dying within approximately twelve hours.

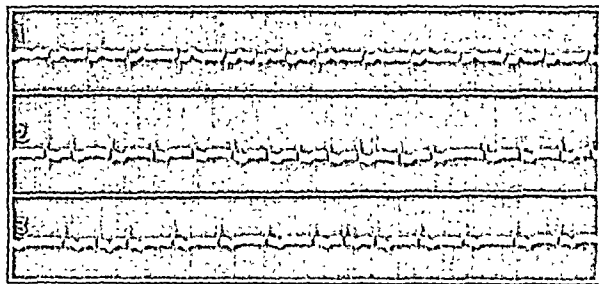


Fig. 3.—Tracing done April 19, 1933.

Pathologic Examination.—Anatomic Diagnosis: 1. Heart. (a) Chronic rheumatic heart disease with mitral stenosis. Calcification of left auricle wall. (b) Concentric atherosclerosis of left coronary artery with stenosis. (c) Left and right ventricle, myocardial hypertrophy. (d) Myocardial dilatation, chiefly right auricle.

2. Liver. Fine diffuse cirrhosis.

3. Spleen. Chronic passive congestion.

4. Aorta. Thrombo-ulcerative atherosclerosis, descending portion.

5. General. Pulmonary edema and atelectasis. Hydrothorax and ascites, edema.

Cause of death. Myocardial insufficiency. Etiology: mitral stenosis, left coronary artery stenosis, and hypertrophy and dilatation of myocardium.

SUMMARY

1. In watching a case of this type over a period of twenty-five years one is impressed with the fact that the prognosis lies to some extent in the cooperation of the individual with the disease.

2. In observing an example of mitral stenosis such as this one, certain conclusions become evident. Although there is no definite evidence of when the mitral lesion developed first, it can be inferred that there was no progressive lesion. The mitral stenosis offered little embarrassment to the heart, and this woman reached extreme old age without heart failure. In addition to the mitral lesion, it was noted post mortem that there was evidence of coronary artery disease as well.

3. The mercurial diuretics which she received for the last five years were undoubtedly an important factor in prolonging her life at the end. Although the case itself is a fine example of the prolongation of life by the continuous use of small doses of digitalis, the mercurial diuretics certainly take precedence over digitalis in congestive failure when edema is a prominent feature. In spite of the use of mercurials over this period there were no changes noted in the kidneys which could be attributed to mercury.

The results with few exceptions were remarkable, since the patient always lost from 8 to 10 pounds (3.6 to 4.5 Kg.) of edema following every injection.

121 East Sixtieth Street.

Read before the Eastern Medical Society of the City of New York, Nov. 30, 1939.

1. There are 5,760 grains to a Troy pound.

ADDICTION TO AMPHETAMINE SULFATE

SIDNEY FRIEDENBERG, M.D., CAMDEN, N. J.

While the more spectacular effects of the new drug amphetamine sulfate (benzedrine sulfate) have been given prominence by recent reports, from my own observation its most popular use, that in the treatment of obesity, has been attended by a paucity of reports and with an evident disregard for the habit-forming qualities of amphetamine.¹

Lesses and Myerson,² postulating an altered appetite regulation in many of the obese, were able to place their patients, by the psychically stimulating and appetite-reducing effects of amphetamine, on a low caloric diet, to which they adhered. Amphetamine has been used successfully by Rosenberg³ to decrease the appetites of a large series of obese patients in conjunction with a low caloric diet. Christian⁴ condemns its use in the treatment of obesity.

My purpose in this report is to warn against the possibility of addiction by the continued use of this new stimulating drug in the routine treatment of obesity.

REPORT OF CASE

A woman aged 30 was 5 feet 1 inch (155 cm.) in height and weighed 190 pounds (86 Kg.) in March 1939. She expressed a desire to lose some of her "all too investing" flesh. Previous to 1931 her weight had been 135 pounds (61 Kg.); following a hysterectomy and a bilateral oophorectomy in that year her weight rose to 190 pounds, remaining there with a few sporadic intermissions, during which she had taken thyroid substance as high as 5 grains (0.3 Gm.) daily with immediate loss of weight, subsequent toxic effects and a relapse. She had occasional menopausal symptoms. Examination revealed a moist skin and proptotic eyeballs—later found to be a hereditary characteristic—which had no difficulty in converging. There was no lid lag and the forehead wrinkled easily. A coarse finger tremor was present. The pulse on many occasions was 92. The temperature was always within the normal range. The blood pressure was 120 systolic, 86 diastolic. The thyroid gland was not palpable. The basal metabolic rate was —11. There were no other significant manifestations. The fasting blood sugar was 98 mg. per hundred cubic centimeters. The Wassermann reaction of the blood was negative. Urinalysis and a complete blood count were within normal limits.

During the course of several weeks on a low caloric diet she lost no weight. In May 1939 she was given 5 mg. (one-twelfth grain) of amphetamine sulfate morning and afternoon with the same diet. During the next few months her weight slowly decreased, the amphetamine being increased gradually to 10 mg. (one-sixth grain) twice a day. The blood pressure remained stationary.

In October 1939 it was decided to decrease the dosage of amphetamine to 5 mg. twice a day with the object of eventually stopping the drug altogether. After a week on this dosage she complained that she felt worn out and depressed—a new complaint for her. The next week she was placed on a placebo and returned in seven days urgently demanding that she be placed on a higher dosage. She now feels that she cannot do without her pills and cannot carry on her arduous occupation (beautician) without the stimulus that the amphetamine supplies. Since she is the family bread winner, the problem is not a minor one.

COMMENT

The continued use of amphetamine may result in addiction. Possible deleterious results from long continued use have not yet been investigated fully.

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1. Report of the Council on Pharmacy and Chemistry J. A. M. A. **111**: 27 (July 2) 1938.

2. Lesses, M. F., and Myerson, Abraham: Human Autonomic Pharmacology: XVI. Benzedrine Sulfate as an Aid in the Treatment of Obesity, New England J. Med. **218**: 119 (Jan. 20) 1938.

3. Rosenberg, Philip: Clinical Use of Benzedrine Sulfate (Amphetamine) in Obesity, M. World **57**: 656 (Oct.) 1939.

4. Christian, H. A., in Osler's Principles and Practice of Medicine, ed. 13, New York, Appleton-Century, 1938.

Special Articles

THE PHARMACOPEIA AND THE PHYSICIAN

PEDIATRIC EMERGENCIES

JOSEPH BRENNEMANN, M.D.

CHICAGO

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—Ed.

Pediatric emergencies find themselves in strange company in a series of papers devoted to "extending information to physicians on the use of official medicines," since relatively few of them require medicinal treatment. When they do, however, the indications are nearly always simple, single and mandatory, and the results are favorable. Only such emergencies will be discussed as occur, alone or predominantly, in childhood or that differ significantly from those of later life.

NEWBORN PERIOD

The newborn infant presents emergencies that are unique. Asphyxia of any degree calls for respiratory stimulation. In the mildest cases flicking cold water or ether on the chest is often all that is necessary. In all the more serious cases the methods of choice, and the most effective, are the use of carbon dioxide inhalation and the Drinker respirator. Yandell Henderson¹ gives the following directions: "The carbon dioxide required for the initial resuscitation should be of whatever strength is needed to induce respiration, but after respiration is started 7 per cent or even 5 per cent is generally sufficient. . . . In premature or otherwise weak babies . . . the inhalation of 5 or 6 per cent carbon dioxide should be repeated several times during the first few days." If these resources are not available some gentle form of artificial respiration must be employed.

Intracranial hemorrhage due to injury at birth, even if it is of clinical significance, offers serious difficulties both as to diagnosis and as to its relationship to asphyxia in a given case. If there has been a difficult and prolonged or a precipitous labor, if the anterior fontanel is tense and full, if there are convulsive seizures, especially if unilateral together with coma, one may assume that this is due to a hemorrhage. If such conditions are not present it is commonly impossible at this time to differentiate a birth injury from a developmental anomaly of the brain. Lumbar puncture probably does no good and from the very nature of the procedure may do harm by increasing intracranial pressure at the time and so inducing more bleeding. If the fontanel is very tense and coma persists, the intravenous injection of from 20 to 50 cc. of 20 per cent dextrose may be of value. Since rest, as nearly absolute as possible, with the use of sedatives if necessary, is the one imperative indication, it is obvious that no disturbing procedure should be employed unless it is clearly indi-

1. Henderson, Yandell: Respiratory Stimulants and Their Doses, J. A. M. A. **108**: 471-475 (Feb. 6) 1937.

cated. Gavage is necessary after a time if food is not taken naturally.

Hemorrhagic disease of the newborn is one of the dramatic emergencies of this period. About the third day of life the baby begins to bleed from multiple sources—mouth, nose, bowels, vagina, subcutaneous tissues, body cavities, internal organs and even into the brain. Bleeding from the bowel and a slight oozing from the vagina, when this occurs alone, has a different cause and is of little significance. Injection of 20 cc. of human blood, usually from the father, 10 cc. in each buttock followed on the next day by an equal or greater amount of blood serum if the bleeding has not been arrested, has reduced a former mortality of nearly 100 per cent to one that approaches zero. The disease is apparently on the wane and may have something to do with the mother's diet.

Tetany, or hypocalcemia, of the newborn has attracted increasing attention in recent years. The symptoms are much like those of tetany of a later period, with convulsions as the outstanding and most alarming symptom. Chvostek's sign is usually positive but often occurs in the normal newborn infant. The blood calcium is far below the normal 9 to 10 mg. per hundred cubic centimeters of blood. If there is no other obvious cause for the convulsions, treatment should be begun at once without waiting for a calcium determination. In milder cases calcium chloride or calcium gluconate may be given by mouth. In more serious cases 10 cc. of a 10 per cent solution of calcium gluconate should be given intravenously or intramuscularly. To this may be added 20 units of solution of parathyroid subcutaneously. Calcium chloride by mouth may be continued for a time, if necessary, until a sufficient amount of calcium has been obtained from milk in the infant's food.

Congenital atresia of the esophagus is not an extremely rare condition. In nearly all reported cases the upper dilated portion of the esophagus ends blindly at about the bifurcation of the trachea, and the lower attenuated portion passes directly from the stomach into the trachea at or near the bifurcation or into a bronchus. The stomach is usually distended, the lower part of the abdomen retracted. Saliva runs from the dependent corner of the mouth and after taking more than two swallows of water the infant chokes, water gushes from his mouth and nose, he becomes profoundly cyanotic and death seems imminent. The diagnosis may be confirmed by x-ray examination after a small amount of barium sulfate is given by mouth or by finding that a catheter passed into the esophagus ends at about 12 cm. from the alveolar border of the mouth. Gastrostomy, with and without preliminary tying off of the gastric end of the esophagus, and jejunostomy have been tried. No child has ever lived, and with the consent of the parents one is justified in letting the child die without treatment. Death follows around the end of the first week of life from bronchopneumonia and starvation.

GASTROINTESTINAL TRACT

Appendicitis presents a true emergency in the first day or two or even three. If uncomplicated, the fever is usually low, the pain not intense, the white blood count moderately high, and vomiting nearly always occurs early. Point tenderness, more marked and more significant than unelicited pain, occurring most often at or below McBurney's point but also anywhere from the flank to the pelvis and, rarely, even to the left of the left rectus muscle, is the single most important sign in

the early stages. In this early period there is usually a voluntary protective contraction of the muscles; involuntary boardlike rigidity indicates peritoneal involvement. Operation is usually clearly indicated in the first two or even three days and at any time if there is spreading peritonitis. If the patient is seen on the third or fourth day and there is an evident tendency for the inflammatory process to become walled off, it is safer to await the disappearance of the mass and to operate a month or two later. In an instance of acute so-called primary peritonitis, nonappendical in origin and due to a pneumococcus or a streptococcus, it is usually better not to operate until localization has taken place. Sulfanilamide or sulfapyridine is indicated depending on whether the cause is a hemolytic streptococcus or a pneumococcus.

Acute intestinal obstructions are relatively frequent in childhood. In the newborn there may be congenital absence or narrowing of a portion of the intestine, more often in the distal ileum, leading to great distress, distention of the abdomen, uncontrollable biliary vomiting and absence of meconium and feces. Surgery is indicated but offers little as a rule. The commonest type of intestinal obstruction is intussusception, usually at the ileocecal junction and predominantly in the first year of life. The onset is uniquely sudden, so that the exact hour of its occurrence is nearly always stated. The child begins abruptly to scream with intense, intermittent, colicky pain, soon followed by vomiting and a varying degree of shock. After a time the pain becomes less severe; he no longer screams or even cries, but with each return of the pain he winces or sighs, draws up his legs or turns over in bed. He no longer smiles, and there is a distant, abstracted, serious, resigned, apprehensive expression that may be misleading but is actually of diagnostic value. Cardinal signs in addition to those mentioned are a slightly tender, sausage-shaped mass, usually in the transverse or descending colon, occasionally in the rectum or even appearing externally, and blood in the stools, though not always in the first one. After this there may be some feces, but there is characteristically an intimate mixture of blood and mucus—rarely only thick, white, glairy mucus. The blood is never copious and never clots, unless there is also a bleeding Meckel's diverticulum (to be discussed later). Of practically pathognomonic significance is a silent spurt of a small amount of a turbid currant jelly-like mixture of blood and mucus which follows the retreating finger after a digital examination. An early intussusception may occasionally be reduced by injecting air or barium sulfate and making gentle pressure under the fluoroscope. Valuable time, however, should not be lost before resorting to surgery, as the condition is a real emergency. Similar obstructions with like indications for treatment occur with volvulus, bands, post-operative adhesions and Meckel's diverticulum. There is usually no definite mass, and there is no blood in the stools; however, both these conditions may occur if Meckel's diverticulum is the starting point of an intussusception.

A hernia, commonly inguinal, may become incarcerated or strangulated. An incarcerated hernia can often be reduced in infants and young children by suspending the body by the feet so that the hips are elevated some distance above the bed. If reduction does not take place after a reasonable time, operation is indicated. Strangulated hernia usually presents more serious symptoms and more urgent indications for treatment. There is

persistent vomiting, pain, tenderness and often shock. Reduction is no longer possible without operation.

Hemorrhage from the bowels is always an arresting symptom and a potential emergency condition. While slight hemorrhages, commonly of obvious causation, occur with papilloma, foreign body, dysentery, intussusception, scurvy, Henoch's purpura and blood dyscrasias, and larger ones with gastric or duodenal ulcers characterized by tarry stools, a copious bright red hemorrhage should always lead one to suspect a bleeding Meckel's diverticulum. The diagnosis is almost certain if the blood clots and is at times bright red and at others darker in color. The bleeding is due to ulceration of so-called misplaced gastric mucosa in the wall of the diverticulum. Rarely, but ominously, the extent of the hemorrhage may not be obvious if only part of the blood is passed. Sudden pallor and marked evidence of secondary anemia should lead to investigation. The hemorrhage commonly ceases spontaneously, but if it persists it is fairly free, and if the diagnosis seems justified the diverticulum should be removed. Perforation of the ulcer, with or without hemorrhage and simulating appendicitis, may occur and even more clearly calls for surgical intervention. Recent observations have shown that a like clinical picture can be produced by papillomas in the colon (demonstrable by x-ray examination).

Foreign bodies in the pharynx may present alarming symptoms, and removal may require skilled assistance. The usual attempt to remove the body with the finger should be avoided except in extreme emergency. If lodged in the esophagus, usually in the upper part, the symptoms may be restricted to discomfort and difficulty in swallowing. Early removal is imperative for fear of rupture into the mediastinum and the pleural cavity, which carries a very high mortality. As a rule, a foreign body that has passed into the stomach will escape through the pylorus and cause no harm in the intestinal tract. Long or peculiarly shaped bodies such as a hairpin or a "bobby pin" may not be able to pass the windings of the duodenum and should be removed from the stomach by an endoscopist, if available; if not, by a surgeon. The x-ray examination is of great value throughout if the foreign body is radiopaque.

RESPIRATORY TRACT

Foreign bodies in the respiratory tract are a common cause of emergency in childhood. In the larynx they may lead to alarming obstruction to breathing. There is usually an inspiratory stridor, hoarseness and a croupy cough that may simulate membranous croup. A pedunculated papilloma of the larynx caught between the vocal cords may produce the same symptoms. There is, however, usually a history of preceding stridor and hoarseness of long standing. In the trachea, if the foreign body is large enough, both main bronchi may be obstructed, resulting in death. If there is only partial obstruction of the trachea or of one main bronchus, there will be an expiratory wheeze that may easily be mistaken for asthma. If the partial obstruction of the bronchus is of the right degree there will be, in addition to the wheeze, an obstructive emphysema on the affected side with possibly eventual respiratory silence and both exaggerated breathing on and displacement of the heart to the opposite side. If the bronchial obstruction is complete, the characteristic signs on the affected side are dulness, absence of breath sounds or bronchial breathing and bronchophony, with exaggerated

breathing on the opposite and displacement of the heart toward the affected side. A roentgenogram is obviously of great confirmatory help in diagnosis whether the body is radiopaque or not. Bronchoscopic removal of the foreign body is indicated at the earliest possible time; imperatively so if it is of vegetable origin, because of the well known serious irritation produced by such substances. Three things may well be stressed: the suspiciousness of a wheeze, the fact that a large percentage of foreign bodies are peanuts, and the fact that, while a foreign body in the respiratory tract is always ushered in by sudden choking, commonly with cyanosis and coughing, the latter is no longer present if the body becomes fixed.

Empyema is a condition calling for immediate action only when there is profound impairment of vital capacity and great displacement of the heart and large vessels. Repeated aspiration or closed drainage with gradual removal of pus is then indicated. A tension pneumothorax, nearly always a pyopneumothorax following rupture of an empyema into a bronchus, with a valvelike mechanism permitting freer entrance than exit of air, commonly presents an urgent condition. There is a tympanitic percussion note, sometimes hard to elicit, shifting dulness and absence of breath sounds on the affected side together with exaggerated breath sounds on and displacement of the heart toward the opposite side. A succussion sound, if present, is pathognomonic. Aspiration is futile. Drainage is indicated usually by the closed gradual method, though replacing tension by a simple pneumothorax through open operation would seem a safe procedure if the air is not allowed to escape too freely for a time.

The croup family, all characterized by laryngeal obstruction, requires careful differentiation, since some of the members are urgently alarming and others only apparently so. Excluding those caused by congenital anomalies, foreign bodies and papillomas, they are all due to inflammation and in varying degree to spasm of the larynx. Spasmodic croup usually is easily recognized, especially if there have been previous attacks and if there is a familial tendency. A young child beyond the period of infancy who has seemed well during the daytime, or has at most a slight respiratory infection, after going to bed at night quite suddenly wakes up with a croupy, barking, brassy, sepulchral cough that is soon followed by loud stridulous breathing, profound respiratory obstruction and great restlessness. The condition seems truly alarming to the uninitiated but is usually quite readily relieved in a warm room by inhalation of steam from a croup kettle or some similar device. The ancient remedy of a teaspoonful of syrup of ipecac is effective but messy and distressing. There may be another attack the following night, but usually there is not.

Catarrhal laryngitis is a simple inflammation of the larynx as part of an infection of the respiratory tract and is characterized by hoarseness, croupy painful cough, inspiratory stridor and fever. Spasm is absent or minimal. The onset is not explosively sudden nor restricted as to time, and the symptoms persist for from several to many days without interruption. The condition is rarely serious and can be ameliorated by having the child kept in a warm room more or less saturated with moisture from a croup kettle or a pan of boiling water. It must be differentiated from membranous croup or laryngeal diphtheria, often not an easy matter at the onset.

Membranous croup is usually less febrile and more insidious in onset but more constantly and definitely progressive. The cough is usually more brassy and tight and the stridor more sharp than in simple laryngitis. As the disease progresses there is profound dyspnea, a loud rasping stridor, retraction of the suprasternal notch and the lower end of the sternum, deep cyanosis and great restlessness. The initial hoarseness descends to a whisper and finally to a complete loss of voice such as rarely occurs with a simple catarrhal laryngitis. As the end approaches, the cyanosis gives way to an ashen gray color and the child ceases to struggle. If there is a membrane in the throat or competent laryngeal observation is available, the diagnosis can usually be made early. A culture of material taken from the larynx may reveal the true nature of the disease but is not dependable, and the result should never be awaited before treatment is begun in a suggestive case. From 20,000 to 40,000 units of antitoxin should be given at once and the result from the culture used as a guide to further treatment. If the dyspnea becomes alarming, as shown by great restlessness, increasing cyanosis and retraction, treatment by suction, intubation or tracheotomy is urgently indicated. Environmental factors will necessarily determine the method of choice in a given case.

Laryngotracheitis, if it can be distinguished except by the course from the more serious condition about to be discussed, usually can be relieved by palliative measures. True laryngotracheobronchitis, involving the bronchi as well as the trachea and larynx, is as serious as membranous croup, if not more so, since there is no specific antitoxin and the course is more prolonged, complicated and exhausting. There is sometimes supraglottic and always laryngeal and subglottic obstructive edema, together with a characteristic involvement of the trachea and bronchi, that leads to the formation of thick, tenacious, gummy, ropy secretions that block the air passages. There are thus in a high degree essentially the symptoms and signs of other forms of croup plus those already described as occurring with foreign bodies in the larynx, trachea and bronchi, together with obstructive subglottic and more rarely supraglottic edema. The indications for treatment are to keep the airways clear. In milder cases bronchoscopic suction and intubation may be successful under favorable conditions. In severer cases presenting marked supraglottic and subglottic edema and bronchial obstruction, tracheotomy is imperative. It alone relieves obstructive supraglottic edema and permits as nothing else does the safe removal of the offending secretions by suction with a catheter or by bronchoscopic aspiration. Retention in a warm room saturated with moisture, not too hot, expert nursing and bronchoscopic and medical teamwork are essential to success in meeting the ominous obstructive conditions that often appear with startling suddenness.

GENITO-URINARY TRACT

Uremia or cerebral edema occurring with nephritis, as manifested by headache, dizziness, somnolence, hypertension and eventually coma and convulsions, calls for prompt relief by intravenous injection of 25 per cent dextrose, 0.5 per cent magnesium sulfate or intramuscular injection of from 2 to 4 cc. of 50 per cent magnesium sulfate at four hour intervals until the blood pressure reaches a safe level. A single, harmless but marked urinary retention of unknown etiology occasionally occurs in childhood. Extreme retention may

occur as a result of painful urination due to ulceration of the meatus from the "ammoniacal diaper." Immediate relief follows a drop of 5 per cent cocaine hydrochloride solution on the ulcer. Repetition is avoided by wet boric acid dressings, or the application of petrolatum and attention to the ammoniacal diaper. The latter is carried out by thoroughly washing, rinsing and boiling all diapers and soaking and drying those which are to be used at night in a saturated solution of boric acid.

Torsion of the testicle, or rather of the cord, is a rare but serious condition. There is sudden, exquisite pain and swelling of the testicle, nausea and vomiting, and often shock. Necrotic gangrene quickly supervenes with relief of subjective symptoms. Immediate operation must be performed if the testicle is to be saved. Campbell² states that removal of the testicle is indicated in 90 per cent of the cases. Spontaneous or therapeutic untwisting of the cord may take place rarely, but even then atrophy is likely to result.

Rupture of a kidney due to a blow or a crushing injury, leading to hematuria and local pain, tenderness and possibly swelling, is nearly always best treated expectantly.

CENTRAL NERVOUS SYSTEM

A convulsion in an infant or a young child occurring at the beginning of a febrile disease or, more rarely, even later in the course of the disease, if the temperature rises rapidly from a low to an adequately high point, has usually the same significance as a chill in an adult and is of relatively little greater importance. It commonly ends spontaneously. If it does not, and especially if there is hyperpyrexia, a tepid, cool or even cold pack is indicated until the fever is reduced to a safe point. Only one thickness or at most two thicknesses of sheet should be used, so that the cooling effect of evaporation may also be called into play. The same procedure will prevent an impending convulsion. Two grains (0.13 Gm.) of acetylsalicylic acid for each year of age, best given in orange or some other heavy syrup, may have the same effect. The use of the conventional hot bath has probably survived only because the convulsion ends in spite of the treatment. If the convulsion still persists it must be controlled even if anesthesia by means of chloroform or avertin with amylene hydrate is necessary. Convulsions occurring periodically during later infancy may be due to tetany and require antirachitic treatment. Occurring periodically at a later period without fever usually means idiopathic epilepsy, although organic disease of the brain must be excluded.

Concussion of the brain, with or without loss of consciousness, is characteristically accompanied by pallor, somnolence and nausea or vomiting. Since organic injury such as hemorrhage has probably taken place, rest is imperative. This is especially indicated if there is a skull fracture, as shown in the roentgenogram, by bleeding from the nose, mouth, ears or into the post-orbital space, or by leakage of spinal fluid. Coma and convulsions or localized twitchings, probably due to hemorrhage, are not infrequent. The present tendency is to avoid spinal puncture for either diagnostic or therapeutic purposes. Rest in bed with restraints for the younger child and elevation of the head of the bed should be enforced for a period of several weeks. The temperature, pulse, respiration and blood pressure

2. Campbell, M. F. The Male Reproductive System, in *Brennemann's Practice of Pediatrics*, Hagerstown, Md., W. F. Prior Company, Inc. 24: 52 (chapter 29) 1932.

should be carefully watched for a time. If coma and hypertension persist, the treatment described for cerebral edema, or even surgical intervention, may be indicated, the latter especially if there are focal signs. Surgery is usually restricted to cases in which there is obvious or well founded suspicion of a depressed fracture. X-ray examination may show a depression restricted to the inner plate of the skull.

METABOLIC DISTURBANCES

Acidosis occurs as a symptom of many conditions, notably in diabetic coma and in alimentary or intestinal intoxications in infancy following great loss of body fluids and overdosage with salicylates or acetylsalicylic acid. The one dependable clinical symptom is hyperpnea or deep breathing, which may early be of normal rate but in more advanced conditions is deep, rapid and pauseless. The urine shows the presence of acetone and diacetic acid, and in diabetic coma there is glycosuria and hyperglycemia. Treatment is urgent. In all cases replacement of body fluids is indicated. In non-diabetic acidosis this should be done by intravenous injection of dextrose and physiologic solution of sodium chloride, or preferably lactate Ringer's solution. In diabetic coma the intravenous administration of Ringer's or lactate Ringer's solution and the intramuscular injection of insulin are urgently indicated. The volume of fluid should be from 20 to 30 cc. per kilogram of body weight and should not be injected faster than 5 cc. a minute. The insulin requirement during acidosis is not less than 1.5 units per kilogram of body weight plus 1 unit for each gram of sugar administered, usually dextrose in 5 per cent solution.

Increasing interest has recently been directed to hypoglycemia. The hypoglycemia of hyperinsulinism is a familiar example. It may, however, occur with startling suddenness and seriousness in other conditions, such as prolonged starvation, inadequate intake of carbohydrate, liver damage and under still other conditions the nature of which requires further observation for clarification. The symptoms vary from irritability, lassitude and somnolence to convulsions and coma. The treatment consists in the prompt administration of orange juice or sugar to restore the blood sugar concentration to normal. If oral administration is impossible or ineffectual, or if the condition is alarming, from 10 to 25 per cent dextrose solution should be given intravenously. The patient is commonly restored to normal while the injection is being given.

Allergy is widespread, and in the markedly hypersensitive individual the injection of a foreign protein such as horse serum may lead to anaphylactic shock and death. Before antitoxin is given the test for sensitivity of the skin should be performed. If positive, the procedure of desensitization should precede the administration of the full dose of serum and the latter should contain an adequate amount of epinephrine. A hypodermic loaded with this drug should be a part of the equipment whenever serum is given.

In acute poisoning the stomach should be washed out thoroughly unless the agent is an escharotic. If the latter is an acid, an alkaline solution should be given; if an alkali, an acid solution, such as diluted vinegar, is given. Information as to antidotes and specific methods of treatment of all other forms of poisoning should be constantly and immediately accessible to every physician.

707 Fullerton Avenue.

MATERNAL MORTALITY, 1938

EDWIN F. DAILY, M.D.

Director, Division of Maternal and Child Health
U. S. Children's Bureau

WASHINGTON, D. C.

The lowest maternal mortality rate ever recorded in the United States, 43.5 per 10,000 live births, has been reported by the United States Bureau of the Census for the year 1938. For the first time on record less than 10,000 (9,953) deaths were assigned to puerperal causes. The number of live births registered in 1938 was 2,286,962, a birth rate of 17.6 per thousand of population. This was a slight increase over 1937.

The maternal death rate for all causes decreased 11 per cent during the year 1938 (from 49 per 10,000 in 1937 to 43.5 per 10,000 in 1938). The combined rate for abortion and ectopic pregnancy decreased 16 per cent; the rate for puerperal sepsis, including phlegmasia

Maternal Deaths in 1938

	Number	Per Cent
Total deaths assigned to puerperal causes (International list numbers 140-150).....	9,953	100
Abortion and ectopic gestation.....	2,253	23
140—Abortion with septic conditions.....	1,380	
141—Abortion without mention of septic condition (to include hemorrhage).....	436	
142—Ectopic gestation.....	437	
Puerperal hemorrhage and other accidents of childbirth.....	2,638	27
144—Puerperal hemorrhage.....	1,320	
149—Other accidents of childbirth.....	1,338	
Puerperal septicemia and puerperal phlegmasia alba dolens, and so on.....	2,398	24
145—Puerperal septicemia (not specified as due to abortion).....	1,874	
148—Puerperal phlegmasia alba dolens, embolus, sudden death (not specified as septic).....	524	
Toxemias of pregnancy.....	2,521	25
146—Puerperal albuminuria and eclampsia.....	2,023	
147—Other toxemias of pregnancy.....	498	
Other accidents of pregnancy, other and unspecified conditions.....	123	1
143—Other accidents of pregnancy (not to include hemorrhage).....	104	
150—Other and unspecified conditions of the puerperal state.....	19	

alba dolens, and so on, decreased 12 per cent; the rate for all toxemias decreased 11 per cent, and the combined rate for puerperal hemorrhage and other accidents of childbirth decreased 7 per cent.

The accompanying table shows the number of maternal deaths in 1938 from several main groups of causes and the percentage of deaths in each of these groups.

Deaths from abortion and ectopic gestation in 1938 have been grouped together because they represent largely deaths occurring early in pregnancy. Deaths from accidents of pregnancy have been combined with those caused by puerperal hemorrhage because they are largely due to hemorrhage and shock associated with delivery. Deaths from phlegmasia alba dolens and other causes in this group are combined with those caused by puerperal septicemia because they are the result of infection. All toxemias are grouped together because it is impossible to separate satisfactorily each type of toxemia on the basis of information on death certificates. These are largely deaths from eclampsia, preeclampsia and nephritic toxemia (not including chronic nephritis, which is considered nonpuerperal). Deaths from accidents of pregnancy include deaths of undelivered women. These have been combined with the small number of deaths unclassified as to cause.

Approximately one fourth of the maternal deaths resulted from abortion or ectopic gestation, while three fourths are concerned with complications of late pregnancy, delivery or the puerperium.

From 1930 through 1934 the maternal mortality rate decreased only 12 per cent. From 1934 through 1938 the maternal mortality rate has decreased 25 per cent.

The decline of 14 per cent in 1937 as compared with 1936 and 11 per cent in 1938 as compared with 1937 represents a decrease of 23 per cent of the maternal mortality rate in the United States in the two year period 1937 through 1938. There would have been 5,370 more maternal deaths in 1938 if the maternal mortality rate of 1930 had applied in 1938.

The application of the best existing knowledge of maternal care to an increasing number of women is being rewarded by an extremely significant decrease in the number of maternal deaths. But further decrease is possible. To bring it about will require continued effort especially in those areas and among the special groups of the population where the rates are still far too high.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

LA FRANCE INHALATOR ACCEPTABLE

Manufacturer: The American-La France-Foamite Corporation, Elmira, N. Y.

The La France Inhalator is a portable apparatus designed for the administration of a mixture of oxygen and carbon dioxide in cases of asphyxia. Standard equipment includes a carrying case with two 16 cubic foot cylinders connected through valves to a rubberized cloth reservoir, which is in turn connected by rubber hose to two face masks and head harnesses. The inhalator may also be obtained with only a single cylinder, with which an outboard connection for use with 50 and 200 cubic foot cylinders is furnished. Accessories clipped in the case include tongue forceps, an oral screw, and two wrenches for making the necessary connections. Optional accessories include extra face pieces in different sizes, various sized cylinders filled with oxygen and carbon dioxide for outboard connection, and a case for carrying two spare 16 cubic foot cylinders. All the cylinders contain 7 per cent carbon dioxide. The weight is 56½ pounds and overall dimensions are 6½ by 15½ by 27 inches.

When in operation the gas flows from a cylinder through a valve to the manifold, where a pressure gage indicates in atmospheres the pressure in the cylinder. The gas then passes to the reducing valve, where a considerable reduction of pressure occurs, and on to the volume control valve. This flow control valve is attached to a radial dial graduated in liters of flow per minute. On the side of the flow control valve is a safety valve which provides escape of gas if for any cause the reducing valve should fail. From the control valve the gas passes to the breathing bag, where it expands to approximately atmospheric pressure and passes through a hose and face piece as required by the patient.

The cylinders are filled to a pressure of 145 atmospheres, or 2,175 pounds per square inch. One cylinder is to be used until empty, when a switch can be made to another one without discontinuing resuscitation. This is made possible by the functioning of the high pressure manifold provided with two valves. When the inhalator is to be used for only one patient, the second supply hose can be disengaged. The breathing of the patient can be observed by observing the expansion and contraction of the bag.

The face piece consists of three main parts: the face piece proper of cellulose acetate, an air-inflated rubber cushion, and the valve mechanism. The valve mechanism consists of three valves: one which opens on inhalation of the patient to admit

gas from the supply hose and closes on exhalation, a second which opens on exhalation and permits escape of the air to the outside, and a third which acts as a safety valve and allows air from the outside to be drawn into the face piece in case additional volume is needed beyond that supplied by the inhalator.

The inhalator was submitted to a qualified specialist for investigation. As a result of the Council investigation it was concluded that the device described as the La France Inhalator appears to be a well designed and constructed piece of equipment.

The Council voted to accept the La France Inhalator for inclusion on the Council's list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

MERCURIC SALICYLATE (See New and Nonofficial Remedies, 1939, p. 319).

Ampoules Mercuric Salicylate 0.065 Gm. (1 grain), 1 cc.: Each cubic centimeter contains mercuric salicylate 0.065 Gm. (1 grain) and quinine and urea hydrochloride 0.02 Gm. (½ grain) suspended in a sweet almond oil and lanum base.

Prepared by the Upjohn Company, Kalamazoo, Mich. No U. S. patent or trademark.

MERCURIC SUCCINIMIDE (See New and Nonofficial Remedies, 1939, p. 320).

Ampoules Mercury Succinimide 0.02 Gm. (½ grain), 1 cc.: Each cubic centimeter contains mercuric succinimide 0.02 Gm. (½ grain) and chlorobutanol not more than 0.008 Gm. dissolved in distilled water.

Prepared by the Upjohn Company, Kalamazoo, Mich. No U. S. patent or trademark.

POLLEN EXTRACTS-BARRY.—Liquids obtained by extracting the dried pollen of various species of plants.

Actions and Uses.—See general article, Allergenic Protein Preparations, New and Nonofficial Remedies, 1939, page 27.

Dosage.—See general article, Allergenic Protein Preparations, New and Nonofficial Remedies, 1939, page 27.

The following pollen extracts-Barry are marketed in packages of three vials, one containing 3 cc. of a solution having a potency of 100 pollen units per cubic centimeter, one containing 3 cc. of a solution having a potency of 1,000 pollen units per cubic centimeter, and one containing 5 cc. of a solution having a potency of 10,000 pollen units per cubic centimeter.

Prepared by the Barry Allergy Laboratory, Inc., Detroit, Mich. No U. S. patent or trademark.

Grass Mixture (Spring), (June Grass, Timothy, Red Top, Sweet Vernal Grass and Orchard Grass pollen extracts, in equal proportions); Ragweed (Large and Small Ragweed pollen extracts, in equal proportions).

Pollen extracts-Barry are prepared by grinding the dried pollen in a ball mill with a liquid containing 25 per cent glycerin, 0.275 per cent sodium chloride, 0.074 per cent sodium phosphate, 0.0285 per cent potassium dihydrogen phosphate and 0.4 per cent of cresol. The originally prepared solution presents a 3 per cent extract (30,000 pollen units per cubic centimeter), which is subsequently diluted to the desired concentration. The extract is subjected to Berkefeld filtration and is tested for sterility before dilution, after dilution and after filling, as required by the National Institute of Health. The finished liquid contains 8 per cent of glycerin and 0.4 per cent of cresol. The pollen unit corresponds to 0.001 mg. of dried pollen.

THEOBROMINE SODIUM ACETATE (See New and Nonofficial Remedies, 1939, p. 522).

Theobromine and Sodium Acetate-Mallinckrodt.—A brand of theobromine sodium acetate-N. N. R.

Manufactured by Mallinckrodt Chemical Works, St. Louis. No U. S. patent or trademark.

PENTOBARBITAL-SODIUM (See New and Nonofficial Remedies, 1939, p. 121).

Pentobarbital-Sodium-Gane.—A brand of pentobarbital-sodium-N. N. R.

Manufactured by Gane's Chemical Works, Inc., New York.

SULFANILAMIDE-LILLY (See New and Nonofficial Remedies, 1939, p. 476).

The following dosage forms have been accepted:

Pulverules Sulfanilamide-Lilly, 3 grains.
Pulverules Sulfanilamide-Lilly, 5 grains.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 16, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

THE COURT OF APPEALS DECISION

Elsewhere in this issue appears a complete statement of the decision of the United States Court of Appeals for the District of Columbia in the case of the government versus the American Medical Association and various other organizations and persons. This statement summarizes the indictment and analyzes the case as being concerned with three main problems. These raise essentially the question as to whether or not there was a combination or conspiracy in restraint of trade as that term is used in the Sherman Act and whether or not the indictment was defective in form. There is a considerable discussion of the significance of the phrase "restraint of trade" and various previous legal decisions on the subject are cited, leading the court to the ultimate conclusion that the effect has been to enlarge the common acceptance of the word "trade" to cover all occupations in which men are engaged for a livelihood.

Although the court recognized the great public value of the work of organizations in raising standards of

conduct and skill, it was also of the opinion that medical societies may not legally effectuate restraints as far reaching as those which are charged. The court pointed out, of course, that the charge may be wholly unwarranted and the facts, when they are disclosed on the trial, may show an entirely different state of affairs. For the purpose of the decision in the present case, however, the court felt that it must consider the charge as though its verity were established, and if that point of view is taken the court felt that the offense is within the condemnation of the statute. The court then went into the question of corporations practicing medicine and said that, where a corporation operates a clinic, employs physicians and surgeons to treat patients and itself receives the fee, the corporation is unlawfully engaged in the practice of medicine. However, the court was of the opinion that, assuming the allegations of the indictment to be true, Group Health Association, Inc., was something different and, therefore, left open until the trial of the case the question whether or not Group Health Association, Inc., was illegally practicing medicine. Finally, the court took up the charges that were made as to the insufficiency of the indictment and reversed the opinion of the lower court on that point.

The repercussions from this decision by the Court of Appeals are already considerable; many of the opinions expressed indicate that this action is far from ending the consideration of this important subject. It becomes apparent at once that every labor as well as every other professional organization in the United States is intimately concerned with this decision. The *Washington Post* points out that it is well to remember that this opinion is not final, that the Supreme Court has not yet spoken and that, even should the Supreme Court sustain the Court of Appeals rather than Judge Proctor, it would still remain to be seen whether the persons charged in the indictment can be convicted under the indictment.

Between the time when the questions relating to the Group Health Association, Inc., were first raised and the time of this decision by the Court of Appeals, many changes have taken place in the structure of American medicine. The question of distribution of risk by the insurance method in meeting the costs of medical service and the relationship of organized medicine to that question can certainly not now be raised, since some fourteen state medical organizations and innumerable smaller medical units in medical organization are themselves engaged in such plans. The Group Health Association, Inc., seems to be functioning, at least to its own satisfaction, in the District of Columbia, and the Medical Society of the District of Columbia itself has a plan for medical service which is also in the status of an operating experiment.

The decision as to whether or not medicine is a profession or a trade is exceedingly important not only as relates to this case but also in relationship to many another piece of legislation of utmost concern to every

scientific, professional, educational and similar organization in the United States. There are numerous problems associated with the laws regulating taxes, social security, licensure and innumerable other rights and privileges involved in medical practice which depend greatly on the distinction between the practice of a profession and a trade or other occupation.

Thus the decisions made by the courts in relationship to the questions that have been raised are basic and far reaching in their ultimate effect on every organized professional body in this country. The principle at issue involves the right of any professional group to regulate its own conduct and even to determine its own membership. As even the Court of Appeals recognized, the existence of such organized bodies has served vastly for the benefit of the people, achieving objectives in raising the standards of education and of service far beyond those which might have been achieved by any other sort of effort, including no doubt even efforts that might be made by various legally constituted or governmental agencies.

Perhaps the thought is in itself a reflection on our present system of social organization, but it is interesting to realize that the determination of the issue on which the Court of Appeals has just made a pronouncement and on which the Supreme Court has yet to rule is of little or of no importance as relates to the provision of medical service at low cost for large numbers of people. It may be of vast significance, however, in serving to bring about revolution in the existing social organization through the breaking down of established bodies. Such a revolution Mr. Thurman Arnold seems to desire if one interprets correctly his book "The Folklore of Capitalism." The issue involved is thus fundamentally whether or not our democracy as now existing is capable of meeting the needs of civilized man or whether some completely new social scheme is going to be necessary to satisfy those officials of government who have taken on themselves the task of creating a new order.

UNITED STATES INFANT AND MATERNAL MORTALITY RATES

Maternal mortality rates of the United States have been reported and discussed for several years apparently to conjure conclusions designed to throw discredit on the medical profession. The publicity of the Interdepartmental Committee repeatedly charged that there had been no significant decline in the rate of maternal mortality "in the registration area" of the United States during the last twenty years. Credence was given to this statement by the fact that the "registration area" was constantly changing as new states, usually with higher mortality rates, were admitted to the area. Since 1931 only two new states (South Dakota in 1931 and Texas in 1932) have been added to the birth registration area. Only in more recent years have any statistics been available for a uniform registration area. In 1931 the death rate for puerperal causes in the registration

area was 6.6 per thousand live births; in 1938 it was 4.4.¹ This is a decline of a little over 30 per cent in eight years.

Again and again the propagandists alleged that the United States was lagging behind most of the other modern nations in its maternal mortality rate. This conclusion was reached by comparing nations, some of which were not larger than some counties in the United States and with an exclusively white population less than that of some American cities, with the entire continental United States with its wide diversity of population, including 10 per cent of Negroes with a peculiarly high maternal mortality rate. Vital statisticians have frequently pointed out that the only fair comparisons of mortality statistics would be between individual states and European nations. The latest reports available from most European nations are for 1937.² In that year the maternal death rates for the countries from which invidious comparisons have previously been made were Australia 4.6, Canada 4.8, Chile 9.9, Germany 4.7, New Zealand 3.6, the Netherlands 2.5, Sweden 3.2. In that year the United States registration area had a maternal mortality rate of 4.9. Much more significant is the fact that in twenty-eight states of the United States the maternal death rate in 1938 was below 4.0. In the following states the maternal death rate was below 3.0: Connecticut 2.6, Minnesota 2.8, North Dakota 2.4, Rhode Island 2.8, Wisconsin 2.9.

Infant mortality, generally considered the most sensitive index of health conditions, shows even more significant declines. This rate is the number of deaths under 1 year in each thousand live births. In 1938 the infant death rate in Great Britain was 53 per thousand live births. In the United States it was 50.5 in 1938, and 48.2 was the provisional rate in 1939. The rate for the white race in the United States for 1939 was 47. In some of the more comparable larger nations the infant death rate in 1937, the latest year for which the Annual Epidemiological Report of the League of Nations gives figures, was as follows: Canada 76, Germany 64, England and Wales 58, the Netherlands 38, Sweden 46. The infant death rates for seven states of the Union in 1938 with the provisional rates for 1939 were as follows:³

State	1938	1939
Connecticut	36.3	35.5
Indiana	42.5	38.7
Minnesota	38.8	35.8
Nebraska	36.4	33.2
Oregon	39.2	34.7
South Dakota	43.8	37.6
Washington	38.7	38.1

The infant mortality rate for Chicago in 1938 was 33.9 and in 1939 it was 31.3. For New York City it was 38.3 in 1938 and 37.1 in 1939.

As far as any information now available reveals, these infant death rates are the lowest for any com-

1. Maternal Mortality by States and Cities, 1915-1938, Vital Statistics—Special Reports, Department of Commerce, Bureau of the Census 9: 118 (Feb. 10) 1940.

2. Annual Epidemiological Report for the Year 1937, Geneva, 1939, pp. 63-79.

3. Monthly Vital Statistics Bulletin—Annual Summary for 1939, Department of Commerce, Bureau of the Census 2: 4 (Feb. 7) 1940.

parable population in the world. In the two European nations with the lowest death rates, the Netherlands has only a system of cash benefits in its system of compulsory sickness insurance and Sweden has only a voluntary system of sickness insurance.

RESPIRATORY ALLERGY IN CHILDREN AND TONSILLECTOMY

The simulation of diseases by pseudosyndromes may confuse the clinical picture, mislead diagnosis and contribute to therapeutic error. Frequent colds, sinusitis, bronchitis and recurrent pneumonias in children are generally considered infectious and related to reservoirs of infection in the tonsils. Consequently tonsillectomy is often prescribed. According to *Public Health Reports* 1,235,000 tonsillectomies are performed each year in the United States. Hansel and Chang¹ now point out that signs and symptoms of respiratory abnormality in the upper tract may frequently be due to an allergic factor simulating the infectious etiology discoverable in the majority of such cases. Hence the proper diagnosis of respiratory diseases centers for them in careful clinical and laboratory examinations that are based on the threefold possibility of an allergic agent, an infective agent and an allergic phase obscured by acute or chronic infections. Ultimate diagnostic determination is achieved by a differential test.

In an examination of 200 unselected children between the ages of 3 and 16, of whom 104 were boys and ninety-six girls, observed at the clinic of the Washington University School of Medicine in St. Louis in July, August and September 1938, the authors discovered twenty-six cases of nasal allergy, equivalent to 13 per cent of the whole group. In only half of the twenty-six were local nasal symptoms typical. A positive family history of allergy was noted in eleven (42 per cent). Only fourteen (54 per cent) showed typical pallor or edema of the nasal mucosa. Seventeen of the twenty-six had had an acute infectious disease (such as measles, scarlet fever or pertussis). Six of the twenty-six had hay fever when examined. Final diagnosis was based on the demonstration of eosinophils in the nasal secretions. The authors believe that, in the absence of hay fever and asthma, nasal allergy and allergic bronchitis frequently elude diagnosis and that tonsillectomy is often recommended because allergic symptoms are mistaken for those of an infectious origin.

Hansel and Chang estimate that about 160,000 allergic patients (13 per cent of the annual total of more than a million and a quarter of tonsillectomized persons) are unnecessarily subjected to tonsillectomy every year. They note sequels of tonsillectomies performed on allergic children, such as excessive regrowth of lymphoid tissue in the tonsillar fossae and aggravation of allergic symptoms. Children with nasal allergy, allergic involvement of the sinuses, allergic bronchitis and

allergic pneumonia are not favorably influenced by tonsillectomy. They caution against the removal of tonsils and adenoids in allergic children during hay fever and against recourse to tonsillectomy with the idea of alleviating allergic symptoms. Indications for tonsillectomy in children with nasal allergy should be the same as those in children without nasal allergy.

Current Comment

FIRST DAY SALE OF THE CRAWFORD LONG MEMORIAL STAMP

A new postage stamp commemorating Dr. Crawford W. Long as the discoverer of ether anesthesia will be issued by the Post Office Department, April 8. The first day sale of the two-cent stamp will be held at Jefferson, Ga., where ether was first used as an anesthetic for a surgical operation, March 30, 1842. This operation was for the removal of a tumor from the neck of James M. Venable. Four witnesses were present, one of whom was Dr. Edward S. Rawls. Dr. Long discussed the possibilities of ether as an anesthetic with his fellow physicians. The Universities of Georgia and Pennsylvania, where Dr. Long studied, have provided memorials, and monuments have been erected in his native Danielsville and at Jefferson, Ga. A hospital in Atlanta has been named in honor of Dr. Long, and on March 30, 1926, his likeness in marble was unveiled in Statuary Hall in the Capitol Building in Washington. Members of the profession can arrange for first day cancellation of the special stamp on official covers arranged by citizens of Jefferson by writing to Mrs. H. I. Mobley, cachet chairman, Jefferson, Ga.

SURGEON GENERAL'S LIBRARY

Constantly in abeyance for almost a decade has been the proposal to erect a new building for the Army Medical Library and Museum in Washington, D. C. Now the path has been cleared, a site has been found near the Library of Congress, and all that is necessary is the final appropriation. The collection of medical works in the Army Medical Library is one of the finest in the world; indeed, it is thought by many to deserve the absolute superlative. Yet it is housed today in an ancient structure, a veritable fire trap, in which an accident of some type might bring about a catastrophic destruction of material which could never be replaced. Certainly if ever a need existed for expenditure of money for some real purpose, it exists in relation to the necessity for building a new home for this invaluable scientific medical collection. Recently the Librarian of Congress, Archibald MacLeish, was asked his opinion of the Army Medical Library. His reply was "The Surgeon General's Library is one of the greatest special collections of books ever put together, if not indeed the greatest, and its present lack of housing holds tragic possibilities for American learning and for the good repute of American learning." In the very near future Congressional hearings will be held on this project. Every physician may well afford to lend his voice to the appeal for immediate action.

1. Hansel, French K., and Chang, C. S.: Relation of Allergy and Tonsillectomy in Children, *Arch. Otolaryng.* 31:45 (Jan.) 1940.

ORGANIZATION SECTION

COURT OF APPEALS UPHOLDS A. M. A. INDICTMENT

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA
No. 7488

UNITED STATES OF AMERICA, APPELLANTS,
v.
AMERICAN MEDICAL ASSOCIATION, A CORPORATION,
THE MEDICAL SOCIETY OF THE DISTRICT OF
COLUMBIA, A CORPORATION, HARRIS COUNTY
MEDICAL SOCIETY, AN ASSOCIATION,
ET AL., APPELLEES

Appeal from the District Court of the United States
for the District of Columbia

(Argued January 12, 1940 Decided March 4, 1940)

Thurman Arnold, Assistant Attorney General, and
John Henry Lewin, Special Assistant to the Attorney
General, both of Washington, D. C., for appellants.

William E. Leahy, *Seth W. Richardson*, *John E.
Laskey*, *Charles S. Baker*, all of Washington, D. C., and
Edward M. Burke, of Chicago, Illinois, for appellees.

Before GRONER, C. J., and MILLER and VINSON, JJ.

GRONER, C. J.: This appeal is taken from a judgment of the United States District Court sustaining a demurrer to an indictment for conspiracy in restraint of trade in the District of Columbia, in violation of Sec. 3 of the Sherman Anti-trust Act.¹

The main purpose of the conspiracy as shown in the indictment was to impair or destroy the business and activities of Group Health Association, Inc., which had been organized in 1937 as a nonprofit cooperative association for the provision of medical care and hospitalization to its members and their dependents. The indictment is very long but, summarized, charges as follows:

Group Health is an association of employees of certain executive departments of the Government employed in the District of Columbia, 80 per cent earning annual incomes not over \$2,000. The association provides medical care and hospitalization to its members and their dependents on a risk sharing prepayment basis. Its funds are collected monthly in the form of dues. Medical care is provided by its medical staff, consisting of salaried physicians under the sole direction of a medical director. It provides a modern clinic and defrays, within certain limits, the expenses of hospitalization of its members and their dependents. The personal relationship ordinarily existing between doctor and patient exists between Group Health doctors and Group Health patients.

Defendant American Medical Association is a corporation, with a membership of 110,000 out of the total of 145,000 physicians in the United States. It is the only important national society representative of the medical profession in the country. It maintains a

"Bureau of Medical Economics," which has taken a leading part in carrying out the Association's policy of discouraging and suppressing group medical practice on a risk sharing prepayment basis.

Defendant The Medical Society of the District of Columbia is a constituent society of American. Defendant Harris County Medical Society is a component society of American. Members of constituent and component societies are *ipso facto* members of American. Washington Academy of Surgery is an unincorporated association with its office in the District of Columbia. Of the individual defendants, five were officers of American, and the others members of District Society, most of the latter being officers or else members of the executive and hospital committees of the Society or members of the regular staffs of Washington City hospitals. American Association and District Society possess power to exclude a doctor, disapproved by them, from attending and treating his patients in the Washington hospitals, which include all the hospitals in the District of Columbia in which private patients may be treated by doctors. By enforcing their rules of ethics and expelling members, they may deprive them of the essential privilege of consultation with other members. By granting or refusing approval of hospitals, they can control the ability of hospitals to obtain interns, and by threatening hospitals with the exercise of this power they may control the members of medical staffs in each. To carry out these powers, on November 3, 1937, District Society adopted the following resolution:

WHEREAS, The Medical Society of the District of Columbia has an apparent means of hindering the successful operation of Group Health Association, Inc., if it can prevent patients of physicians in its employ being received in the local private hospitals; and

WHEREAS, The Medical Society of the District of Columbia has no direct control over the policies of such hospitals as determined by their lay boards of directors, except through its control of its own members serving on their medical staffs; and

WHEREAS, Conflicts between the Medical Society of the District of Columbia and any local hospitals arising from an attempt to enforce the provisions of chapter IX, article IV, section 5, of its constitution should be assiduously avoided, if possible, because of the unfavorable publicity that would accrue to its own members; therefore, be it

Resolved, That the Hospital Committee be, and is hereby, directed to give careful study and consideration to all phases of this subject and report back to the Society, at the earliest practicable date; its recommendations as to the best way of bringing this question to the attention of the medical boards and boards of directors of the various local hospitals in such a manner as to insure the maximum amount of practical accomplishment with the minimum amount of friction and conflict.

Subsequently, the conspiracy was discussed at meetings held by members and committees of District Society, with the purpose of "hindering" Group Health from procuring and retaining on its medical staff quali-

1. 26 Stat. 209, 15 U. S. C. 3.

fied doctors by threatening with disciplinary action any members of District Society who should either join Group Health's staff or consult with physicians on its staff, and with the purpose of hindering and obstructing members of Group Health from obtaining access to hospital facilities and obstructing the doctors on its staff from treating and operating on patients in Washington hospitals, and for the purpose of inducing Washington hospitals to boycott Group Health and its doctors. A "white list" of approved organizations, groups and individuals was circulated, with the name of Group Health omitted—all for the purpose of threatening with disciplinary action any member of the District Society who worked for Group Health or consulted with any doctor on its staff and any hospital which admitted any Group Health doctor to its courtesy staff—the general purpose of the conspiracy being to restrain doctors in the District of Columbia in the pursuit of their calling and to restrain the hospitals in the operation of their business and to destroy Group Health in the performance of its functions. Disciplinary action was taken against two District Society members on Group Health's staff. One was induced to resign from the staff, the other was expelled from the society. Harris County Society opened disciplinary action against one of its members on the staff. District Society opened disciplinary action against a specialist who consulted with a Group Health doctor. Demand was made on the hospitals that they receive only members of the American Medical Association on their staffs. On recommendation of Washington Academy of Surgery, a surgeon was excluded from hospital staffs principally because he was working for Group Health. By threatening to deprive another doctor of courtesy staff privileges, defendants induced a Group Health doctor to resign his position.

The conspiracy is charged to have had as its background the long continued policy of opposition on the part of American Medical Association to risk sharing plans for medical service, growing out of the fear of its members of business competition from doctors connected with such organizations. Each defendant is charged to have knowingly participated in the formation and furtherance of the plan pursuant to the common purpose.

The several defendants demurred on a number of grounds, attaching not only the substance but the form of the indictment.

The District Court sustained the demurrer (1) because the practice of medicine is not a trade within the meaning of sec. 3 of the Sherman Act; (2) because the indictment is vague and uncertain and fails to charge clearly commission of any crime.

The United States has appealed under the provisions of the Act of March 3, 1901, ch. 854, 31 Stat. 1225, 1341, D. C. Code 1929, tit. 6, sec. 355.

The case divides itself into three main problems:

1. Does the indictment charge a combination or conspiracy in restraint of "trade" as that term is used in sec. 3 of the Sherman Act?

2. If it does, is the restraint charged an unreasonable one which would be illegal under the act?

3. Is the indictment defective in form?

Sec. 3 of the statute reads as follows:

Every contract, combination in form of trust or otherwise, or conspiracy, in restraint of trade or commerce in . . . the

District of Columbia . . . is hereby declared illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

The trial court was of opinion that the practice of medicine and the business of Group Health and the hospitals do not constitute "trade" within the intent of the statute. The question is new, at least to the extent that there is no case in which, in the circumstances existing here, it has been decided, but a careful consideration of the language of the act, its legislative background and the various statements of the Supreme Court concerning the source from which the congressional purpose may be gathered, leads us to conclude the trial court was in error.

The phrase "restraint of trade" had its genesis in the common law, and its legal import and significance is declared again and again in the decisions of English courts, both before and after the date of our independence, as well as in American decisions in many of the states. The Supreme Court has said that Congress passed the Sherman Act with this common law background in mind. And so in the *Standard Oil* case,² Chief Justice White traces its use to the common law. Thus, at the top of page 51, he says:

It is certain that those terms, at least in their rudimentary meaning, took their origin in the common law and were also familiar in the law of this country prior to and at the time of the adoption of the act in question.

And again:

It is certain that at a very remote period the words "contract in restraint of trade" in England came to refer to some voluntary restraint put by contract by an individual on his right to carry on his trade or calling. Originally all such contracts were considered to be illegal, because it was deemed they were injurious to the public as well as to the individuals who made them.

And still again (p. 59):

Let us consider the language of the first and second sections guided by the principle that where words are employed in a statute which had at the time a well known meaning at common law or in the law of this country they are presumed to have been used in that sense unless the context compels to the contrary.

In view of the common law and the law in this country as to restraint of trade, which we have reviewed, and the illuminating effect which that history must have under the rule to which we have referred, we think it results:

(a) That the context manifests that the statute was drawn in the light of the existing practical conception of the law of restraint of trade, because it groups as within that class, not only contracts which were in restraint of trade in the subjective sense, but all contracts or acts which theoretically were attempts to monopolize, yet which in practice had come to be considered as in restraint of trade in a broad sense.

Similar statements are to be found in *United States v. American Tobacco Co.*, 221 U. S. 106, 179; *Nash v. United States*, 229 U. S. 373, 377; *Eastern States Retail Lumber Dealers Ass'n v. United States*, 234 U. S. 600, 610; *United States v. Addyston Pipe & Steel Co.*, 85 Fed. 271, 278-9, aff'd 175 U. S. 211;

2. 221 U. S. 1, 50-60.

United States Tel. Co. v. Central Union Tel. Co., 202 Fed. 66, 70. There are like statements in the debates in Congress. 21 Con. Rec. 3146, 3148, 3152. And see Judge Taft's opinion in the *Addyston Pipe Co.* case, where he said:

It is certain that, if the contract of association which bound the defendants was void and unenforceable at the common law because in restraint of trade, it is within the inhibition of the statute. . . .

In *Leonard v. Abner-Drury Brewing Co.*, 25 App. D. C. 161, 174, we said as much with respect to sec. 3 of the act. It must, therefore, be considered that the scope of "restraint of trade" in sec. 3 is to be measured by its use at common law.

The common law rule was applied principally to contracts whereby a man promised not to engage in his occupation, including the practice of medicine, and in many English cases such a restraint on the practice of medicine was described as a contract in "restraint of trade." Defendants contend, however, that whatever the English usage, the word "trade" had in this country a definite and well understood meaning, and as used in the Sherman Act was confined to transportation and the buying, selling, or exchanging of commodities and in any case was not intended to apply to any employment or business carried on by the "learned professions." The determination of this aspect of our problem lies in the answer to this proposition.

In *Atlantic Cleaners & Dyers v. United States*, 286 U. S. 427, it was held the words "trade" and "commerce" had a broader meaning in sec. 3 of the act than in sec. 1 and that, under the paramount power of Congress to legislate for the District of Columbia, the use of the words in that section should be held to embrace the exercise of that paramount power to its fullest extent.—

We are, therefore, free to interpret § 3 dissociated from § 1 as though it were a separate and independent act and, thus viewed, there is no rule of statutory construction which prevents our giving to the word "trade" its full meaning, or the more extended of two meanings, whichever will best manifest the legislative purpose.

(p. 435.)

Cleaners and dyers in the District had formed a combination to keep up prices, and the United States brought suit to enjoin the agreement and reestablish competition. The defendants insisted their arrangement was not a violation of sec. 3 because they were not engaged in trade, relying on *National League Clubs v. Federal Baseball Clubs*, 50 App. D. C. 165, 168, holding that "trade" connotes the transfer of something, "whether it be persons, commodities, or intelligence from one place or person to another." The opinion ignored the citation, doubtless because the baseball case was brought under section 1—the interstate commerce section of the act—and Justice Sutherland, who wrote the opinion, rejected this restricted definition as applied to sec. 3. In support of a definition to include the cleaning business, he quoted from Justice Story's opinion in *The Nymph*, 18 Fed. Cas. 506, No. 10,388:

. . . the word "trade" is often and, indeed, generally used in a broader sense, as equivalent to occupation, employment, or business, whether manual or mercantile. Wherever any occupation, employment, or business is carried on for the purpose of profit, or gain, or a livelihood, not in the liberal arts or in the learned professions, it is constantly called a trade.

The learned trial judge felt that the italicized words should be regarded as an authoritative statement of the Supreme Court that the professions were not trades and therefore not within the intent of the act. But we think this by no means follows. The court had before it only the problem whether "trade" was broad enough to include the cleaning and dyeing of clothes, and held it was. To reinforce its reasoning, the court quoted language which happened to exclude the learned professions, but this limitation was not responsive to the question at hand and was purely casual, and in the circumstances ought not, we think, to be regarded as a proper guide in deciding the important question in this case.

The same might be said of *Fed. Trade Com. v. Raladam Co.*, 283 U. S. 643, where Justice Sutherland said that physicians followed a profession and not a trade. He was dealing with a case of interstate commerce and simply pointed out the obvious fact that doctors were not in the patent medicine trade, and could not be in competition with vendors of medicine within the sense of the Trade Commission Act. There, he was using the word "trade" in its narrowest sense, a restriction which, as we have seen, he later rejected in regard to sec. 3 of the Sherman Act.

The common law cases which shed light on the question are all of a type. A physician, a surgeon, or a dentist has an established practice in a community. He takes on an assistant, or a partner, or else sells his practice to another of his own profession. In the first two cases he wants to protect his own practice, and in the third case the buyer wants protection from subsequent competition by the seller. Consequently, the assistant, or partner, or seller, as the case may be, promises for a consideration not to practice within the community or within a designated distance. This promise is a voluntary restraint on the pursuit of a man's calling, and in the circumstances, the public policy described by Chief Justice White in the *Standard Oil* case becomes involved. The restraint will be upheld only if it (1) is partial; (2) is made for an adequate consideration; and (3) is reasonable as a protection of the good will of another's professional practice. *Holbrook v. Waters*, 9 How. Prac. (N. Y.) 335.

In England such a contract was constantly referred to as involving the doctrine of "restraint of trade." See *Davis v. Mason*, 5 T. R. 118, 101 Eng. Rep. 69; *Hayward v. Young*, 2 Chitty 407; *Atkins v. Kinnier*, 4 Ex. 776, 154 Eng. Rep. 1429; *Gravelly v. Barnard*, L. R. 18 Eq. 518. In all of the above the lawyers who raised the point and the judges who passed on it referred to the public policy as the doctrine of restraint of trade, contracts in restraint of trade, or in partial restraint of trade. In *Horner v. Graves*, 7 Bing. 735, 131 Eng. Rep. 284, defendant had promised not to practice within 100 miles of York. The opinion of Tindall, C. J., recognizes the occupation of surgeon-dentist as a profession, but in considering the validity of the contract he uses the words "profession," "business" and "trade" interchangeably.

American cases decided before passage of the Sherman Act recognize and follow the reasoning of these English cases. See *Cook v. Johnson*, 47 Conn. 175, which involved a dentist's contract. There the court said that it belonged to the class of contracts in restraint of trade. To the same effect, see *Haldeman v. Simon-*

4. Footnote citations in the British report as follows: (2) [1915] 3 K. B. 556. (3) [1917] 1 K. B. 305. (4) (1855) 6 E. & B. 47. (5) (1867) L. R. 2 Q. B. 153. (6) (1890) 62 L. T. 292. (7) (1904) 99 L. T. 840. (8) [1912] A. C. 421.

The charge, stated in condensed form, is that the medical societies combined and conspired to prevent the successful operation of Group Health's plan, and the steps by which this was to be effectuated were as follows: (1) to impose restraints on physicians affiliated with Group Health by threat of expulsion or actual expulsion from the societies; (2) to deny them the essential professional contacts with other physicians; and (3) to use the coercive power of the societies to deprive them of hospital facilities for their patients. Sufficient facts are stated to demonstrate that, unchecked, this exertion of power will necessarily accomplish the abandonment of the cooperative plan of medical service, as well as destroy the livelihood of dissident doctors, because the general restraint thus applied would make impossible the continued operation of the one or the successful practice of medicine by the others.

Defendants say that what they are charged with doing amounts to no more than the regulation of membership in the society and the selection of the persons with whom they wish to associate; that under their rules disobedient members may lawfully be disciplined and that discipline does not amount to unreasonable restraint. This may very well be true, and in considering the contention we are not unmindful of the importance of rules of conduct in medical practice, rules which can best be made by the profession itself. We recognize, in common with an almost universal public opinion, that in the last half century, through this means, the quack and the charlatan have been largely deprived of the opportunity of preying on the unfortunate and the credulous. We also recognize that in personal conduct and in professional skill the rules and canons, so established, have aided in raising the standards of medical practice to the advantage of the whole country. We are mindful of a generally known fact that under these rules and standards there has developed an *esprit de corps* largely as a result of which the members of the profession contribute a considerable portion of their time to the relief of the unfortunate and the destitute. All of which may well be acknowledged to their credit. Notwithstanding these important considerations, it cannot be admitted that the medical profession may through its great medical societies, either by rule or disciplinary proceedings, legally effectuate restraints as far reaching as those now charged. "An act harmless when done by one may become a public wrong when done by many acting in concert, for it then takes on the form of a conspiracy, and may be prohibited or punished, if the result be hurtful to the public or to the individual" against whom it is directed. *Eastern States Retail Lumber Dealers Ass'n v. United States*, 234 U. S. at p. 614. If there is any justification for the restraint, so as to make it reasonable as a regulation of professional practice, it must be shown in evidence as a defense, since it does not appear in the indictment.

Restraints prohibited by sec. 3 of the Sherman Act are those which unduly hinder a person from employing his talents, industry, or capital in any lawful undertaking and thus keep, the public from receiving goods and services as freely as it would without such restraints. Enough has been said to show that the restraint here charged would restrict the common liberty of Group Health, the doctors, and the hospitals from engaging in the pursuit of their respective functions. If on the trial the charge of confederation to this end is sustained, defendants' method of reaching their objective may be thereby defeated, but if the objective is wise—as they

insist—they still have left, as was said by the English judge in the *Pratt* case, the safer and more kindly weapons of legitimate persuasion and reasoned argument. In the proper use of these, much, as we think, may be accomplished to avoid the growing movement toward professional regimentation. Or, this opportunity neglected, members of the medical associations in the District of Columbia perhaps may find in sec. 3, as we construe it, their only protection in the right to practice on a fee for service basis.

In the light of what has been said, we consider the numerous cases involving the reasonable operations of trade associations and trade unions as inapplicable. Organizations and rules which have as their purpose the improvement of conditions in any particular trade or occupation, and the regulation of relations between traders, are, as we have just pointed out, beneficial rather than detrimental to the public interest. But when these same organizations go so far as to impose unreasonable restraints on the operations in their field, they become subject to the prohibition of the Sherman Act. *Sugar Institute v. United States*, 297 U. S. 553, 597-600.

Appellees rely on the following state court decisions: *Harris v. Thomas* (Texas Civ. App.), 217 S. W. 1068; *Porter v. King County Medical Society*, 186 Wash. 410, 58 Pac. 2d 367; *Irafin v. Lorio*, 169 La. 1090, 126 So. 669; *Weyrens v. Scotts Bluff County Medical Society*, 133 Nebr. 814, 277 N. W. 378; *Strauss v. Marlboro County Hospital*, 185 S. C. 425, 194 S. E. 65; *Newton v. Board of Commissioners*, 86 Colo. 446, 282 Pac. 1068; *McDonald v. Massachusetts General Hospital*, 120 Mass. 432; *Branagan v. Buckman*, 67 Misc. 242, 122 N. Y. Supp. 610; and *Olander v. Johnson*, 258 Ill. App. 89. They insist these cases sustain the view that disciplinary action taken against one of their number by an association of physicians pursuant to its canons of ethics is permissible and does not violate the common rights either of the individual or of the public. We have examined these cases and are of opinion that, with the exception of the *Porter* and *Weyrens* cases, none is apposite. Those two cases do tend to sustain the actions of medical societies in their attempt to control the scale of medical fees, but in so far as they hold such action to be lawful and deny any right to the injured individual to obtain redress, we cannot accept them as binding or even persuasive authority in the decision of what is or is not lawful under the Sherman Act. The doctrine of restraint of trade was not involved in either case. In the *Weyrens* case, an expelled physician asked a court to order his reinstatement in his medical society, before he had exhausted his remedies within the organization. In the *Porter* case, a layman lost his job because defendants had induced his employers to close their business. The lawfulness of the inducements was considered solely in the light of what a society might do with respect to its membership and selfish motives were deemed immaterial. In our view, the Sherman Act must be applied with respect to public interests, and this raises broader issues than these two cases contain.

At the risk of tedious repetition, we repeat that the charge made here, and for the purposes of the demurrer admitted, is that the societies sought to restrain an association of persons of modest means from receiving medical services at lower cost and to coerce doctors and hospitals to this end. The charge may be wholly unwarranted and the facts, when they are disclosed on the

trial, may show an entirely different state of affairs, but for present purposes we must take the charge as though its verity were established; and in that light, it seems to us clear that the offense is within the condemnation of the statute. It certainly cannot be doubted that Congress intended to exert its full power, in the public interest, to set free from unreasonable obstruction the exercise of those rights and privileges which are a part of our constitutional inheritance, and these include immunity from compulsory work at the will of another, the right to choose an occupation, the right to engage in any lawful calling for which one has the requisite capacity, skill, material, or capital, and thereafter the free enjoyment of the fruits of one's labors. Congress undoubtedly legislated on the common law principle that every person has individually, and that the public has collectively, a right to require the course of all legitimate occupations in the District of Columbia to be free from unreasonable obstructions; and likewise in recognition of the fact that all trades, businesses and professions, which prevent idleness and exercise men in labor and employment for the benefit of themselves and their families and for the increase of their substance, are desirable in the public good and any undue restraint upon them is wrong and is immediate and unreasonable and, therefore, within the purview of the Sherman Act. For illustrations of this principle, see *Loewe v. Lawlor*, 208 U. S. 274; *Eastern States Lumber Dealers Assn. v. United States*, 234 U. S. 600; *Lawlor v. Loewe*, 235 U. S. 522; *Duplex Printing Co. v. Deering*, 254 U. S. 443; *Bedford Cut Stone Company v. Stone Cutters Association*, 274 U. S. 37; *Montague v. Lowry*, 193 U. S. 38; *United States v. Brims*, 272 U. S. 549.

In the *Eastern States* case, an association of retail lumber dealers, in a desire to protect their local retail trade against competition by wholesalers selling to consumers within local territory, agreed to report any information received by any one of them showing such sales by any wholesaler. This information when obtained was sent to the secretary of the association and if, upon investigation by a board, it was found to be true, the name of the wholesaler was placed on a list distributed among all the members. The purpose was to induce all retailers who received the list to withhold patronage from the offender. The Supreme Court held that the circulation of the list was in unreasonable restraint of commerce, since it influenced retailers with no personal grievance to cease trading with the offender.

... the trade of the wholesaler with strangers was directly affected, not because of any supposed wrong which he had done to them, but because of the grievance of a member of one of the associations, who had reported a wrong to himself, which grievance when brought to the attention of others it was hoped would deter them from dealing with the offending party.

This practice, the court said, brought the act within the prohibited class of undue and unreasonable restraints. If what was proved there was unreasonable, what is charged here is so in a larger degree, since the effect in the present case on the activity to be restrained is more serious as well as more far reaching.

Defendants contend as a subsidiary argument that, without regard to whether the restraint would or would not be an illegal act ordinarily, it is not so in the present instance for the reason that Group Health as a corporation is itself illegally practicing medicine. The United States District Court decided to the contrary

some time ago, in a suit for declaratory judgment.⁵ There was no appeal, and the question, so far as we are concerned, may be said to be open. On this demurrer it is unnecessary, and indeed undesirable, that we should pass on it except to decide whether, as described in the indictment, Group Health is necessarily violating the law.

The practice of medicine in the District of Columbia is subject to licensing and regulation and, we think, may not lawfully be subjected "to commercialization or exploitation." As was well said in *People v. United Medical Service*, 362 Ill. 442, 200 N. E. 163, the practice of medicine requires something more than the financial ability to hire competent persons to do the actual work. And so it has been held under varying conditions, speaking generally, that where a corporation operates a clinic or hospital, employs licensed physicians and surgeons to treat patients, and itself receives the fee, the corporation is unlawfully engaged in the practice of medicine. This is true because it has been universally held that a corporation as such lacks the qualifications necessary for a license, and without a license, its activities become illegal.⁶ It has also been said that the relationship of doctor and patient, well recognized in the law, would be destroyed by such an arrangement. On the other hand, some courts have drawn a distinction between practicing medicine and merely furnishing medical services.⁷

But in all the cases we have examined in which the practice has been condemned, the profit object of the offending corporation has been shown to be its main purpose, and in no case were the circumstances precisely like those described in the indictment, i. e., a nonprofit organization, conducted so that the proper doctor and patient relationship is preserved; prospective patients organized only for the purpose of providing a clinic and paying doctors and hospital service out of members' dues; a plan designed not to interfere with the doctor's loyalty to his patient so as to commercialize medicine in a way contrary to the best interests of patient or practice, or to subject the physician to the corporation's control and make his practice a corporate act. As thus described, it is no more than a group of persons, under corporate organization, contributing stated sums of money monthly for the payment of prospective medical services to the extent they may be required. In these respects, it differs from the medicine-practicing corporations which in many of the states have been held to be illegal. Without more, there-

5. *Group Health Assn., Inc. v. Moor*, 24 F. Supp. 445.

6. Cases holding that a corporation was practicing medicine, or dentistry, or surgery illegally are: *McMurdo v. Getter*, (Mass.) 10 N. E. 2d 139 (employer was vendor of eye glasses prescribed by doctor); *Pacific Insurance Co. v. Carpenter*, 10 Cal. App. 2d 592, 52 P. 2d 992 (employer was in the insurance business, making money out of premium profits); *State v. Boston System Dentists, (Ind.)* 19 N. E. 2d 919 (employer was a corporation authorized to engage in practicing dentistry and the salaried dentists were its servants for hire); *Winstow v. Kansas State Board*, 115 Kan. 450, 223 P. 308 (employer incorporated for the purpose of maintaining dental quarters, furnishing services of dentist, and selling dental equipment); *State v. Bailey Dental Co.*, 221 Iowa 781, 234 N. W. 260 (corporation maintaining dental offices); *People ex rel. Lederman v. Warden of City Prison*, 168 App. Div. 240, 152 N. Y. Supp. 977 (drug store employed physician to give free medical attention to its customers); *People v. Painless Parker Dentist*, 85 Colo. 304, 275 Pac. 928 (corporation furnishing dental services through its employee for its profit); *People v. United Medical Service*, 362 Ill. 442, 200 N. E. 157 (corporation furnishing medical service on a flat fee to customers for its own profit). See also *Hannon v. Siegel-Cooper Co.*, 167 N. Y. 241, 60 N. E. 597; cf. *In re Co-operative Law Co.*, 198 N. Y. 479, 92 N. E. 15.

7. *State Electro-Medical Institute v. State*, 74 Neb. 40, 103 N. W. 1078; *Same v. Platter*, 74 Neb. 23, 103 N. W. 1079; *Sager v. Lenoir*, 128 Mo. App. 149, 106 S. W. 541.

fore, than now appears, we are unable to say that Group Health is illegally practicing medicine.

We come finally to the question whether the indictment is sufficient in form. The learned trial judge was of opinion it was not. He thought the indictment afflicted with vague and uncertain statements and lacking in material facts. On the argument in this court, appellees' contentions may be summarized as follows: that the indictment is generally indefinite, full of conclusions and opinions, and does not set out the offense with particularity; the allegations as to the background of the conspiracy and the power of the medical organizations are irrelevant; the character of Group Health and the business of the Washington hospitals are not properly shown; there is a variance between the risk sharing plans described in the background of the conspiracy and the description of the activities of Group Health; the averments as to the principles of medical ethics and the operation of the societies are insufficiently stated; there are no facts stated as to restraints on hospitals; the averment as to dates is insufficient; and there is no charge against the individual defendants.

We shall consider briefly these points.

It has been stated time and again as a fundamental rule that in an indictment all the essential elements of the offense must be averred with sufficient clearness and particularity to enable the accused to understand the nature of the charge against him and enable him intelligently to prepare to meet it, and to plead the result, whether conviction or acquittal, as his protection against another prosecution for the same offense. But the degree of particularity requisite to accomplish these purposes is all that is required. As we said in *Beard v. United States*, 65 App. D. C. 231, 234, 82 F. 2d 837, 840:

R. S. Sec. 1025⁸ was enacted for the purpose of preventing miscarriage of justice through the application of technical rules in relation to matters of form in indictments, and it is now universally held that the sufficiency of a criminal pleading is to be determined by practical, rather than technical, considerations. Or, as the Supreme Court said, the rigor of the old common-law rules has yielded in modern practice to the general principle that formal defects not prejudicial will be disregarded. *Hagner v. United States*, 285 U. S. 427, 52 S. Ct. 417, 76 L. Ed. 861.

In *Nash v. United States*, 229 U. S. 373, 378, it was held that no overt acts need be charged in an indictment under the Sherman Act, and the cases under the act show that the indictments usually set out the organization of defendants, the extent of their control over the trade, their relations with each other, and the means whereby they conspired to perpetrate the restraint.⁹ The indictment at hand contains these averments. It charges that all the defendants have engaged in a combination and conspiracy in restraint of trade. It sets out the place of the conspiracy and the plans of the conspirators and the means taken to make them effective. The restraint was to be imposed on Group Health, on physicians, and on Washington hospitals, and it is

specifically stated that the conspiracy was to prevent doctors of Group Health from treating and operating on patients in the hospitals within the District of Columbia. The preamble to the resolution adopted by District Society, to which we have already referred, declares the society's apparent power of hindering Group Health if it can prevent patients of physicians in the employ of Group Health being received in the hospitals, and the indictment charges the subsequent circulation among the hospitals of the white list as the means to this end. This is a sufficient charge of a conspiracy to restrain the business of Group Health, the doctors, and the hospitals.

The "background" of the conspiracy as described in the indictment cannot, under any circumstances we can think of, be considered as prejudicial, and its relevancy, we think, is established by the opinion of the Supreme Court in *Chicago Board of Trade v. United States*, 246 U. S. at p. 238.

Allegations as to the power of the medical organizations are not irrelevant. They give to the conspiracy a significance in regard to restraining the practice of medicine, which it might not otherwise have, and are similar to allegations, in other indictments, of the control over a large amount of a particular trade.

The point that Group Health is not sufficiently described is answered in the paragraph of the indictment which sets out its incorporation, its purpose, its character, its activities, and its relationship to its members.

The alleged variance between the risk sharing plans described in the "background," which it is charged the American Medical Association habitually opposed, and the plan of Group Health, seems to us immaterial. The obvious purpose of the indictment is to charge that all risk sharing plans have been opposed and that the present restraint is merely another attack.

We think it was unnecessary to set out any more detailed facts as to the contents of the Principles of Medical Ethics and the operations of committees and society meetings. Cf. *Mercer v. U. S.*, 61 F. 2d 97, 98-9. It is enough to charge the conspiracy and the means used to effect the unlawful restraints. Overt acts are unnecessary. *Nash v. U. S.*, *supra*.

There is a sufficient allegation of dates. The indictment, it is true, states the beginning of the conspiracy shortly prior to the incorporation of Group Health, but it also shows that it continued to the date of the presentation of the indictment. That is enough.

The final point is that there is no definite charge against the individual defendants. The indictment in the opening paragraph names the associations and persons made defendants. The individuals are stated as the persons "who will be referred to hereinafter as 'individual defendants,'" and they are thereafter described in the succeeding paragraphs as members or officers in the societies and members in or officers of the hospitals or members on the staffs of the hospitals; and it is clear that their activities in the conspiracy are charged as done in their several stated capacities. All are charged with participation in the formation and furtherance of the conspiracy.

In view of the foregoing, we have no doubt that, reading the indictment as a whole, it states a case under sec. 3 of the Sherman Act.

Reversed and Remanded.

8. 18 U. S. C. A. 556.

9. *U. S. v. Patten*, 226 U. S. 525, 536-9; *U. S. v. Par. & Arctic Ry. & Nav. Co.*, 228 U. S. 87, 88-94; *Krauer v. U. S.*, 237 Fed. E. U. S. v. *Rentlen*, 233 Fed. 793; *U. S. v. New Departure Mfg. Co.*, 204 Fed. 107, 109-110; *U. S. v. Patterson*, 201 Fed. 697, 699-701, *rev'd* on other grounds but *aff'd* as to first count of indictment, 222 Fed. 599, *cert. den.* 238 U. S. 635; *Steers v. U. S.*, 192 Fed. 1, 6-7; *U. S. v. Swift*, 188 Fed. 92; *U. S. v. American Naval Stores*, 186 Fed. 592, *rev'd* on other grounds but *aff'd* as to indictment, 229 U. S. 373; *U. S. v. MacAndrews & Forbes*, 149 Fed. 823, 825-9; *United States v. National Malleable & Steel Casting Co.*, 6 F. 2d 40, 41; 3 *Zolne's Fed. Crim. Proc.* 40, 54.

LEGISLATION OF INTEREST TO PHYSICIANS CONSIDERED BY STATE LEGISLATURES IN 1939

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V. RIGHTS AND DUTIES OF PRACTITIONERS

A. Rights and Privileges

INSURING PAYMENT OF MEDICAL BILLS.—*Liens for Physicians.*—Proposals failed of enactment in five states³⁵⁶ to grant to physicians treating persons injured through the negligence of others liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons by reason of their injuries. Two bills were rejected in New Jersey³⁵⁷ to amend the law granting such a lien to a licensed physician. A bill which, if enacted, would have had the effect of giving an attending physician a broad lien on all the property, both real and personal, of the person or persons employing him was rejected in South Dakota.³⁵⁸

Priority of Physicians' Claims Against Assets of Insolvent Decedent.—A bill died in Delaware³⁵⁹ which proposed that in the distribution of the assets of an insolvent decedent funeral expenses and reasonable bills for medicine and medical attendance during the last sickness and for nursing should be paid before any other claims against the estate.

Motor Vehicle Accident Compensation.—Bills failed of enactment in New York³⁶⁰ and North Carolina³⁶¹ which, in effect, proposed to require motor vehicle owners in applying for an automobile license either to furnish a bond or an insurance policy or to pay a sum in addition to the registration fee required by law for the purpose of establishing a fund with which to pay the hospitalization and medical expenses of persons injured in motor vehicle accidents.

EQUAL RIGHTS FOR PRACTITIONERS OF ALL KINDS.—*Right to Practice in Hospitals.*—Bills were killed in eight states³⁶² to require all governmental hospitals and hospitals supported in whole or in part by public funds or exempt from taxation to permit all practitioners of the healing art to practice within their confines. Three of these bills³⁶³ proposed also to impose this requirement on all hospitals whether or not they received any public moneys or were exempt from taxation. An Arizona bill³⁶⁴ which would have required governmental hospitals to permit osteopaths to practice therein on the same terms and under the same conditions as doctors of medicine was killed. The Washington senate also rejected a similar proposal³⁶⁵ to make it unlawful for any hospital organized as a charitable institution to refuse to any licensed physician and surgeon the use of facilities therein or the right to attend patients therein, for the direct or indirect reason that a particular physician and surgeon contracts to give medical service in consideration of payment of periodical premiums or dues or because of any physician's membership or nonmembership in any society or other lawful organization.

An unsuccessful Maine bill³⁶⁶ proposed that all tax-exempt hospitals or hospitals receiving public funds must permit osteopaths licensed to practice obstetrics and surgery to practice therein and must furnish laboratory service to outpatients of such practitioners. Another Maine bill was also killed³⁶⁷ which proposed that such hospitals must furnish laboratory services to such practitioners. A defeated Wisconsin bill³⁶⁸ proposed that no hospital supported in whole or in part by public funds or exempt from taxation should discriminate against any physician whose license to practice had been revoked and subsequently restored.

356. Del. S. 253; Ill. S. 52 (this bill was enacted but as enacted the lien is given to hospitals only); N. Y. S. 337, A. 413; Ore. S. 353; S. C. S. 325.

357. N. J. S. 209, S. 210.

358. S. D. S. 25.

359. Del. S. 225.

360. N. Y. A. 1280.

361. N. C. S. 185.

362. Ark. S. 293; Calif. A. 2809; Conn. H. 1025; Mich. S. 424; Minn. H. 1484; N. Y. A. 1137; N. D. H. 170; Okla. H. 103.

363. Calif. A. 2809; Minn. H. 1484; Okla. H. 103.

364. Ariz. H. 115.

365. Wash. S. 159.

366. Me. H. 1706.

367. Me. H. 2238.

368. Wis. A. 543.

Right to Treat Workmen's Compensation Cases.—Proposals failed in California,³⁶⁹ Oregon,³⁷⁰ Washington³⁷¹ and Wisconsin³⁷² which, if enacted, would have permitted an injured workman to have his industrial injury treated by any person licensed to practice any of the healing arts at the expense of the state or at the expense of the employer, according to the particular compensation law. An Arizona bill,³⁷³ which was killed, proposed in effect to confer on osteopaths the right to treat compensation cases. Proposals to confer similar rights on chiropractors were killed in Minnesota³⁷⁴ and Wisconsin.³⁷⁵

Right to Treat Relief Cases or to Participate in Public Health Programs.—Laws were enacted in South Dakota³⁷⁶ and Tennessee³⁷⁷ which provide, in effect, that in expending public funds for medical care no distinction is to be drawn between the legally authorized branches of healing. The South Dakota law specifically gives each relief client the right to select a practitioner of his own choice, regardless of school of practice. However, the South Dakota law does provide that it is not to affect the state board of health in the administration of the program relating to services for crippled children.

Bills were killed in Missouri,³⁷⁸ New York³⁷⁹ and North Dakota³⁸⁰ which proposed, in effect, that in the providing of medical assistance to indigent persons equal rights and privileges had to be given to licensed practitioners of every school of medicine or healing recognized by the laws of the state. Somewhat similar bills were killed in Arizona,³⁸¹ Massachusetts,³⁸² Missouri,³⁸³ Oklahoma³⁸⁴ and Rhode Island³⁸⁵ which provided that in public health work and in the distributing of medical care to the indigent all doctors of medicine and osteopaths must be accorded equal rights and privileges. A bill was killed in Arkansas³⁸⁶ which proposed that whenever any public funds were to be used to pay any part of the medical or hospital fees of any person employed on any project under the supervision and control of the state or federal government, all licensed physicians and surgeons in the state and all regularly operated hospitals had to be given an equal right to attend and/or hospitalize such persons.

VENEREAL PROPHYLACTICS.—A law was enacted in Washington³⁸⁷ or other distribution, except by _____ and by licentiates of the state board of pharmacy, of any device, medical preparation or compound which is or may be used, designed, intended, or which has or may have special utility, for the prevention and/or treatment of venereal diseases.

Similar bills were killed in four other states.³⁸⁸

PRIVILEGED COMMUNICATIONS.—The New Mexico privileged communication law was so amended this year³⁸⁹ as to provide that a licensed physician or nurse cannot be examined without the consent of the patient as to any communication made by the patient with reference to any real or supposed venereal or loathsome disease or any knowledge concerning such disease. The new law further provides that no physician or nurse

employed by a workmen's compensation claimant can be required to divulge any information obtained while treating the claimant except where the treatment is at the expense of the employer.

Unsuccessful attempts were made in three states³⁹⁰ to provide that in any civil or criminal cause a licensed physician should not be allowed or compelled to disclose, except with the patient's consent, any information acquired in attending a patient which was necessary to enable the physician to prescribe or act for the patient. A similar bill was introduced in Alabama³⁹¹ and may be acted on when the legislature convenes again in June 1940.

Unsuccessful attempts were made in Ohio and Utah to amend the laws³⁹² prohibiting a physician from testifying concerning a communication made to him by his patient in that relation except by the express consent of the patient.

EXPERT WITNESSES.—Bills were killed in five states³⁹³ proposing that whenever in any civil or criminal proceeding issues arise on which the court deems expert evidence desirable, it may appoint one or more experts, not exceeding three on any issue, to testify at the trial, and the fact that such experts have been appointed by the court was to have been made known to the jury.³⁹⁴ The Pennsylvania House rejected a proposal³⁹⁵ that a written report or a finding of facts prepared by an expert not a party to a cause nor an employee of a party nor financially interested in the result of the controversy, containing the conclusions resulting wholly or partly from written information by the cooperation of several persons acting for a common purpose, should, as far as the same might be relevant, be admissible when testified to by the person or one of the persons making such report or finding without calling as witnesses the persons furnishing the information and without producing the books or other writings on which the report or finding was based, if in the opinion of the court no substantial injustice would have been done to the opposing party.

LIMITATION ON MALPRACTICE ACTIONS.—A new Missouri law³⁹⁶ provides that a licensed physician or the owner or operator of any private sanatorium or hospital shall not be liable in damages for the restraint of any insane person or persons of feeble or disordered mind by reason of having in good faith furnished care, treatment or attention to such persons.

An unsuccessful attempt was made in Indiana³⁹⁷ to provide that all actions against physicians, dentists, hospitals or sanatoriums for malpractice, error, mistake or failure to cure should be commenced within two years after the cause of action accrues and that a cause of action would be deemed to have accrued on the date of the act or neglect complained of. Two bills failed of enactment in Arkansas³⁹⁸ which proposed to require malpractice actions to be instituted within three years after the accrual of the cause of action. A cause of action, however, was not to be deemed to have accrued until the date it is discovered by the patient.

RIGHT TO COMPOUND AND DISPENSE PRESCRIPTIONS.—A bill died in Florida³⁹⁹ proposing to authorize every licensed physician to compound and fill prescriptions written by him in his practice from a drugstore or apothecary owned and operated by him.

RIGHT TO EXTRACT TEETH.—A new Arkansas law⁴⁰⁰ amends the dental practice act so as to provide

369. Calif. A. 2177.

370. Ore. S. 311.

371. Wash. S. 85.

372. Wis. A. 55, S. 185.

373. Ariz. H. 115.

374. Minn. H. 234.

375. Wis. A. 411.

376. S. D. Laws, 1939, c. 106.

377. Tenn. Public Acts, 1939, c. 102.

378. Mo. S. 342.

379. N. Y. A. 2107.

380. N. D. H. 113.

381. Ariz. H. 115.

382. Mass. H. 1277.

383. Mo. H. 152, S. 348.

384. Okla. S. 253.

385. R. I. H. 884.

386. Ark. S. 367.

387. Wash. Laws, 1939, c. 192.

388. Ariz. H. 148; Minn. S. 1262; Nev. A. 29; R. I. H. 913.

389. N. M. Laws, 1939, c. 235.

390. Del. S. 151; Ill. H. 506; W. Va. H. 156.

391. Ala. S. 124.

392. Ohio H. 204, H. 401; Utah S. 24.

393. Ark. S. 194; Ill. S. 197, H. 498; Mass. H. 1487; Pa. H. 367.

Wash. S. 77.

394. All these bills, except the Massachusetts bill, were practically identical with the uniform expert testimony act prepared by the National Conference of Commissioners on Uniform State Laws.

395. Pa. H. 368.

396. Mo. Laws, 1939, c. —, approved May 27, introduced as H. 264.

397. Ind. H. 418.

398. Ark. S. 284, H. 434.

399. Fla. H. 234.

400. Ark. Acts, 1939, Act. No. 157.

that nothing therein "shall prohibit or prevent any licensed physician from extracting teeth in an emergency when he shall deem it advisable and when a licensed dentist is not reasonably available."

EXEMPTION FROM OCCUPATIONAL TAX.—A bill was killed in Arkansas ⁴⁰¹ proposing to exempt from the payment of any privilege or occupational tax levied by any city or town which does not maintain a free medical clinic any physician whose services are largely given to the care of the indigent sick.

RIGHT OF ALLEGED INSANE PERSON TO EXAMINATION BY PHYSICIAN OF OWN CHOICE.—An unsuccessful attempt was made in Massachusetts ⁴⁰² to provide that when a person under complaint or indictment for crime is committed to a hospital for the insane, the defendant shall have the right to be examined as to his mental condition by two physicians selected by him and that all reasonable expenses incurred by such examination should be paid as in the case of other court expenses.

B. Duties and Liabilities

OCCUPATIONAL TAXES.—The Revenue Act of 1939 of North Carolina ⁴⁰³ imposes an annual tax of \$25 on practicing physicians, osteopaths, chiropractors, chiropodists, dentists, optometrists, opticians and any other person practicing "any professional art of healing for a fee or reward."

An unsuccessful attempt was made in Massachusetts ⁴⁰⁴ to impose an annual occupational tax of \$5 on all persons practicing any profession. A bill was killed in Washington ⁴⁰⁵ to impose an additional annual license fee of \$5 on physicians, \$3 on drugless healers and \$3 on midwives. The legislature of Florida killed a bill ⁴⁰⁶ to amend the law imposing an annual state license tax on practitioners of any profession so as to permit counties and incorporated cities and towns each to levy an additional license tax of 50 per cent of the state license tax.

GROSS INCOME OR RECEIPT TAX.—Unsuccessful attempts were made in five states ⁴⁰⁷ to levy a tax of varying percentages on the gross income of physicians, dentists and other licensed practitioners of the healing art.

REPORTS OF WOUNDS, DISEASES AND DEFECTS.—A new Alabama law ⁴⁰⁸ requires a physician diagnosing or treating a case of syphilis, gonorrhea, chancroid, venereal lymphogranuloma or granuloma venereum to report the facts immediately to the county health officer.

A similar bill failed in New Jersey.⁴⁰⁹

A new Massachusetts law ⁴¹⁰ requires a physician in attendance at the birth of a child born with visible congenital deformities or birth injuries to report within thirty days after birth to the state department of public health and the city or town clerk of the place where the birth occurred.

A new Maryland law ⁴¹¹ requires a physician, pharmacist, dentist, hospital or nurse treating any person in Montgomery County for an injury which was caused by or shows evidence of having been caused by an automobile accident or by a lethal weapon to report the facts as soon as practicable to the county police.

A new New York law ⁴¹² requires a physician treating a patient with cancer or other malignant tumor to report the facts to the appropriate health officer.

A Montana law ⁴¹³ requires physicians treating a person suffering from a disease contracted from employment to report the facts to the state board of health. Another Montana law ⁴¹⁴ requires physicians and hospitals on the request of the Division of Industrial Hygiene to report details concerning instances of occupational diseases treated.

An unsuccessful attempt was made in Indiana ⁴¹⁵ to require every physician within twenty-four hours after first learning of the existence of an occupational disease to report the facts to the state board of health.

Proposals were rejected in Pennsylvania to require physicians to report stated defects or diseases to the appropriate health authorities. One bill ⁴¹⁶ proposed to require such a report with respect to a patient in whom is found sex abnormality, sex perversion or sex criminal tendencies. Another bill ⁴¹⁷ proposed to require a physician to report to designated health authorities the name of any patient suffering from or affected with any disease which is communicable, infectious or contagious. Bills were killed in Pennsylvania ⁴¹⁸ and Texas ⁴¹⁹ to require every physician to notify in writing the appropriate local health officer of every case of any form of tuberculosis which comes under his professional observation.

INSTILLING PROPHYLAXIS INTO INFANTS' EYES.—A new South Carolina law ⁴²⁰ requires every physician, midwife, nurse or other person attending the delivery at birth of a child to instill, or have instilled, into the eyes of the baby within one hour after birth a 1 per cent solution of silver nitrate, or some equally effective prophylactic approved by the state department of public health, for the prevention of blindness from ophthalmia neonatorum.

Similar bills were considered and killed in California ⁴²¹ and Florida,⁴²² the Florida bill being vetoed by the governor.

DESIGNATION OF SCHOOL OF PRACTICE.—A new West Virginia law makes it unlawful for any person to use the prefix "Doctor" or "Dr." in connection with his name in any letter, business card, advertisement, sign or public display of any nature without affixing thereto suitable words or letters designating the degree which he holds.⁴²³

A somewhat similar bill ⁴²⁴ was killed in New Mexico.

The Oregon law requiring a person using the title "Doctor" in connection with the practice of the healing art to add after his name a designation of his school of practice was so amended this year ⁴²⁵ as to require a person using the expression "clinic, institute, specialist or any other assumed or artificial name or title" in connection with the practice of the healing art to add after any such assumed or artificial name a designation of his school of practice. No person may use any designation or artificial or assumed name except a person licensed to practice in Oregon.

SEROLOGIC TESTS OF PREGNANT WOMEN.—A detailed discussion of the legislation considered this year to require physicians attending pregnant women to take

401. Ark. S. 242.

402. Mass. H. 1543, redrafted as H. 2152.

403. N. C. Public Laws, 1939, c. 158.

404. Mass. H. 1432.

405. Wash. H. 387.

406. Fla. H. 197.

407. Conn. S. 399; Ind. H. 34; Kan. H. 375; Mass. H. 1220; N. D. H. 388.

408. Ala., Laws, 1939, Gov. No. 229.

409. N. J. S. 171.

410. Mass., Laws, 1939, c. 326.

411. Md., Laws, 1939, c. 703.

412. Laws, N. Y., 1939, c. 892.

413. Mont., Laws, 1939, c. 322.

414. Mont., Laws, 1939, c. 127.

415. Ind. H. 114.

416. Pa. S. 503.

417. Pa. H. 161.

418. Pa. H. 431.

419. Tex. H. 246.

420. S. C., Laws, 1939, Gov. No. 236.

421. Calif. A. 2764.

422. Fla. S. 263.

423. W. Va., Laws, 1939, c. —, Law Without Approval, March 17, introduced as S. 159 (a companion bill, H. 352, died in the house).

424. N. M. H. 259.

425. Ore., Public Acts, 1939, c. 353.

samples of their blood and to make or cause to be made serologic tests for syphilis will be found on page 878.

PROHIBITION OF OPERATION TO IMPEDE IN IDENTIFICATION.—Bills were considered and killed in New York⁴²⁶ to prohibit the performance of an operation, the purpose or effect of which is to change or alter the skin or tissues of the fingers or thumbs so as to alter such person's finger patterns or fingerprints, and to prohibit also the performing of any operation of plastic surgery on a known criminal, the purpose or effect of which is to alter his personal appearance and make identification and apprehension difficult. These bills also proposed to require a physician to report immediately to appropriate police officials all requests for operations which seem to come within the provisions of the bill.

LIMITATION ON RIGHT TO DISPENSE.—A bill failed of enactment in Wisconsin⁴²⁷ proposing so to amend the pharmacy practice act as to provide that its provisions should not interfere with the dispensing of drugs by physicians in an emergency, provided only such drugs shall be kept in stock by a physician as are necessary for emergency use.

ANNUAL RENEWAL OF LICENSES.—A proposal to require all persons licensed to practice medicine, osteopathy or chiropractic to renew their licenses annually with their respective boards of examiners and to condition renewal on the presentation of evidence that the applicant in the preceding year had attended recognized classes or clinics for the purpose of pursuing postgraduate study of subject or subjects pertinent to his system of healing for not less than ten class hours of fifty minutes each during the year was rejected in Michigan.⁴²⁸

LIMITATION ON FEE CHARGED.—A bill was killed in Oklahoma⁴²⁹ to prohibit a licensed practitioner of the healing art, in making professional calls away from his office, to charge or collect more than his regular fee for each call plus fifty cents per mile for each mile actually and necessarily traveled in going from his office to the place where he attended the patient.

BLOOD TESTS ON PHYSICIANS.—An unsuccessful attempt was made in Indiana⁴³⁰ to require every physician, dentist and nurse, at least once every two years, to cause to be submitted to an approved laboratory for a standard serologic test for syphilis a sample of his or her blood. If such test showed that the practitioner was infected with syphilis the license of that practitioner was automatically to be suspended and remain suspended so long as the disease was in a communicable stage.

WRITTEN DIAGNOSIS TO BE GIVEN PATIENT PRIOR TO OPERATION.—Bills were rejected in two states⁴³¹ which proposed to require a physician either before performing an operation or after removing an organ or limb to deliver a written explanation as to the nature of the operation performed or to be performed and the reason that such an operation was necessary. One of these bills⁴³² proposed to require the physician to deliver one copy of the diagnosis referred to to the patient and one copy to the state board of health, which was to preserve it as a permanent public record. One of the bills⁴³³ proposed, in addition, to require a hospital wherein a limb or organ of a patient had been removed to preserve the limb or organ until such time, not exceeding six weeks after the operation, as it should be made known to the hospital whether or not the patient wished to view the limb or organ.

SECRET REMEDIES TO BE REVEALED TO STATE BOARD OF HEALTH.—A bill was withdrawn by its sponsor in Arkansas⁴³⁴ which proposed to require any hospital, physician or person engaged in any of the healing arts who claims to possess a secret remedy which will relieve human suffering to deliver such secret to the state board of health for the benefit of the people of the state.

VI. LEGISLATION RELATING TO ALLIED PROFESSIONS AND SUNDRY VOCATIONS

DENTISTRY.—Laws amending or supplementing existing dental practice acts were adopted in Arizona,⁴³⁵ Arkansas,⁴³⁶ California,⁴³⁷ Delaware,⁴³⁸ Illinois,⁴³⁹ Kansas,⁴⁴⁰ Maine,⁴⁴¹ Maryland,⁴⁴² Michigan,⁴⁴³ New Hampshire,⁴⁴⁴ New Jersey,⁴⁴⁵ New Mexico,⁴⁴⁶ Oregon,⁴⁴⁷ Rhode Island⁴⁴⁸ and Wisconsin.⁴⁴⁹ The new Arizona, Michigan and Rhode Island laws among other things, impose certain prohibitions against advertising on the part of licentiates. Generally, the laws follow the language used in an amendment to the Oregon dental practice act adopted in 1933, which the Supreme Court of the United States has held valid in *Semler v. Oregon State Board of Dental Examiners*, 55 S. Ct. 570. The provisions in question either authorize the revocation of a license or impose a penalty on a licentiate guilty of "advertising professional superiority or the performance of professional services in a superior manner; advertising prices for professional service; advertising by means of large display, glaring light signs, or containing as a part thereof the representation of a tooth, teeth, bridgework or any parts of the human head; employing or making use of advertising solicitors or free publicity agent; or advertising any free dental work or free examination; or advertising to guarantee any dental services, or to perform any dental operation painlessly."

The new Michigan law is of particular interest in that it also forbids a dentist from announcing or holding himself out to the public as limiting his practice to, or as being especially qualified in, or as giving special attention to, any branch of dentistry, without first having obtained a license therefor from the board of dental examiners. Before an applicant can obtain such a license he must prove to the board that he has had a minimum of one year of postgraduate work in any one of the several recognized branches of dentistry in an approved college or university and has complied with any additional requirements that the board might impose. The license that the board issues in such cases authorizes the dentist to hold himself out or to announce to the public that he is especially qualified to, or limits his practice to, or gives especial attention to such recognized branch of the dental profession as the license states.

The new Maryland law makes it a misdemeanor for any person, corporation, partnership or dental laboratory to solicit or advertise by mail, card, newspaper, pamphlet, radio or otherwise, to the general public to construct, produce or repair prosthetic dentures, bridges, plates, appliances or other appliances to be used or worn as substitutes for natural teeth.

Legislation specifically prohibiting unlicensed individuals from managing, operating, owning or conduct-

435. Ariz., Laws, 1939, c. 54.

436. Ark., Acts, 1939, Act No. 150.

437. Calif., Laws, 1939, c. 464, c. 466, c. 554.

438. Del., Laws, 1939, c. —, approved May 1, introduced as H. 315.

439. Ill., Laws, 1939, p. 713, p. 714.

440. Kan., Laws, 1939, c. —, approved April 3, introduced as S. 17.

441. Me., Public Laws, 1939, c. 50.

442. Md., Laws, 1939, c. 405.

443. Mich., Acts, 1939, Public Act No. 122.

444. N. H., Laws, 1939, c. —, approved March 20, introduced as H. 33.

445. N. J., Laws, 1939, c. 168.

446. N. M., Laws, 1939, c. 291.

447. Ore., Laws, 1939, c. 520, c. 521.

448. R. I., Laws, 1939, c. 717.

449. Wis., Laws, 1939, c. 216.

426. N. Y. A. 1265, S. 1301.

427. Wis., A. 719.

428. Mich. H. 559.

429. Okla. H. 354.

430. Ind. H. 494.

431. Mass. H. 756, H. 757; N. M. S. 160.

432. N. M. S. 160.

433. Mass. H. 757.

434. Ark. S. 401.

ing a place where dental operations are performed was enacted in Illinois⁴⁵⁰ and Wisconsin.⁴⁵¹

A new Wyoming law⁴⁵² requires one member of the state board of health to be a licensed dentist.

Unsuccessful attempts were made in eleven states to amend existing dental practice acts.⁴⁵³

A bill, which died in Illinois,⁴⁵⁴ proposed a procedure whereby a person might obtain a license to engage in dental laboratory services and to prohibit unlicensed persons from engaging in such services. The bill proposed, however, that its provisions should not apply to licensed dentists and to persons who render dental laboratory services exclusively for not more than one dentist. A far reaching proposal was killed in California⁴⁵⁵ which proposed to create the dental corporation of California, to consist of all licensed dentists and licensed dental hygienists in the state and to be governed by a state dental board, whose members were to be selected by members of the corporation. Members of the existing board of state dental examiners were to be the first state dental board, but as their terms expired they were to be replaced by persons selected by the corporation. This state dental board was to exercise all the rights and assume all the duties now exercised by the board of dental examiners.

NURSING.—New nursing practice acts were adopted in California,⁴⁵⁶ Connecticut⁴⁵⁷ and Missouri.⁴⁵⁸ The new California law⁴⁵⁹ defines the practice of nursing as "the performing of professional services requiring technical skill and specific knowledge based on the principles of scientific medicine, such as are acquired by means of a prescribed course in an accredited school of nursing . . . and practiced in conjunction with curative or preventive medicine as prescribed by a licensed physician and the application of such nursing procedures as involve understanding cause and effect in order to safeguard life and health of a patient and others." The law then prohibits a person from practicing nursing as just defined unless licensed by the board of nurse examiners. The new Connecticut law contains somewhat similar provisions. It defines the practice of nursing as "(a) The performing, for compensation and under the direction of a licensed physician, of any professional service requiring special education, knowledge and skill in nursing care of those mentally or physically ill and in the prevention of illness; or (b) the performing, for compensation and under the direction of a licensed physician, of any of the simpler procedures required in nursing care of the sick, not involving the specialized education, knowledge and skill specified in subsection (a)." The law then prohibits any person from practicing nursing as just defined unless registered or certified in accordance with the terms of the act.

Existing nursing practice acts were amended in Alabama,⁴⁶⁰ Illinois,⁴⁶¹ Maine,⁴⁶² Michigan,⁴⁶³ New Hampshire,⁴⁶⁴ North Dakota,⁴⁶⁵ Oklahoma,⁴⁶⁶ Ten-

nessee⁴⁶⁷ and Vermont.⁴⁶⁸ Of particular interest is a provision in the new Illinois law which requires applicants for certificates as registered nurses to be citizens of the United States.

Unsuccessful attempts were made in eleven states to amend existing nursing practice acts.⁴⁶⁹

MEDICAL TECHNICIANS.—Unsuccessful attempts were made in Florida⁴⁷⁰ to enact a so-called medical technicians practice act and to create a board of examiners to examine and license persons to practice as medical technicians. The bills proposed to define "a medical technician" as a "person who is engaged in the practice of standardized or experimental technical procedures, the results of which are interpreted by the physician in the diagnosis of disease." The bills proposed that the provisions of the act should not apply to an office assistant or nurse who, in addition to his or her routine duties, performed such laboratory procedures as ordinary blood counts, urinalyses and basal metabolic tests whose results are used only by the employer-physician in his private practice of medicine and who assumes responsibility for the work so performed.

PHARMACY.—A new pharmacy practice act was enacted this year in New York.⁴⁷¹ Existing pharmacy practice acts were amended or supplemented by laws enacted in nineteen other states.⁴⁷² The new laws as a rule are not of sufficient interest to warrant a detailed discussion here. Among other things, one of the new Maine laws⁴⁷³ makes it unlawful for any person to distribute at retail any veronal or barbitol or any other salts, derivatives or compounds of barbituric acid, or any registered, trade-marked or copyrighted preparation registered in the United States Patent Office containing the above substances, except on the written order or prescription of a licensed physician, dentist or veterinarian. The prior law permitted such drugs to be distributed at retail if dispensed by a pharmacist. The prior laws did not limit the distribution of any registered, trade-marked or copyrighted preparation registered in the United States Patent Office containing the drugs referred to unless it contained more than 40 grains (2.6 Gm.) to the avoirdupois fluid ounce (30 cc.). The new Massachusetts law⁴⁷⁴ vests in the board of registration in pharmacy discretionary power in granting permits to stores to transact a retail drug business. Under the prior law the board had no discretion in the matter and was forced to grant a permit with respect to an application made in a proper manner. The new Montana law⁴⁷⁵ authorizes the state board of pharmacy to license stores other than pharmacies wherein may be sold ordinary household or medicinal drugs prepared in sealed packages or bottled by manufacturers. The new Washington law⁴⁷⁶ requires every proprietor or manager of a pharmacy or drug store to keep in his place of business a suitable book or file of

450. Ill., Laws, 1939, p. 714.

451. Wis., Laws, 1939, c. 216.

452. Wyo., Laws, 1939, c. 3.

453. Calif. A. 2810, S. 990, S. 1183; Conn. S. 20, S. 298, S. 544, H. 1488; Fla. H. 270; Ill. H. 886, H. 885, H. 712, H. 655, H. 584; Iowa H. 348; Mich. H. 47; Mo. H. 579; Neb. Bill 183; Tenn. H. 988, H. 1398, S. 1008; Wash. H. 529, S. 264; Wis. A. 366.

454. Ill. S. 337.

455. Calif. S. 990.

456. Calif., Laws, 1939, c. 651, c. 807.

457. Conn., Laws, 1939, c. 355.

458. Mo., Laws, 1939, c. —, approved June 8, introduced as S. 248.

459. Calif., Laws, 1939, c. 807.

460. Ala., Laws, 1939, Gov. No. 486, 487.

461. Ill., Laws, 1939, p. 720.

462. Me., Public Laws, 1939, c. 87.

463. Mich., Laws, 1939, Act No. 30.

464. N. H., Laws, 1939, c. —, approved April 5, introduced as

H. 146.

465. N. D., Laws, 1939, c. 187.

466. Okla., Laws, 1939, c. —, approved Feb. 24, introduced as

H. 226.

467. Tenn., Laws, 1939, c. 28.

468. Vt., Laws, 1939, c. —, approved March 23, introduced as S. 8.

469. Calif. A. 564, A. 563, S. 960; Conn. H. 1034; Fla. H. 393,

S. 271; Mass. H. 759, H. 858, H. 2326; N. Y. A. 1691, S. 1033, A.

2206, S. 1828, S. 1321; N. C. S. 441; Ohio H. 188; Pa. S. 594, H. 1103,

H. 1104; R. I. H. 962; Tenn. S. 137; Texas H. 712, S. 468.

470. Fla. S. 1171, H. 1935.

471. N. Y., Laws, 1939, c. 869.

472. Ark., Laws, 1939, Act 120; Calif., Laws, 1939, c. 567, c. 1002;

Del., Laws, 1939, c. —, approved Feb. 23, introduced as H. 10, c. —,

approved May 13, introduced as H. 219; Fla., Laws, 1939, c. 19323;

Ida., Laws, 1939, c. 62, c. 116; Ill., Laws, 1939, p. 719; Ind., Laws,

1939, c. 16; Me., Public Laws, 1939, c. 35, c. 52, c. 209; Md., Laws,

1939, c. 319; Mass., Laws, 1939, c. 138; Mo., Laws, 1939, c. —,

approved June 23, introduced as S. 196, c. —, approved June 22, intro-

duced as S. 197, S. 199, S. 200, S. 201, c. —, approved Mar

22, introduced as S. 202 and S. 204, c. —, approved June 22, intro-

duced as S. 203; Mont., Laws, 1939, c. 175; Neb., Laws, 1939, c. —,

approved June 1, introduced as Bill 104; N. H., Laws, 1939, c. —,

approved March 30, introduced as S. 19; N. J., Laws, 1939, c. 85; Tenn.,

Public Acts, 1939, c. 36; Vt., Laws, 1939, c. 28; W. Va., Laws, 1939,

c. 45; Wis., Laws, 1939, c. 448.

473. Me., Pub. Laws, 1939, c. 202.

474. Mass., Laws, 1939, c. 138.

475. Mont., Laws, 1939, c. 175.

476. Wash., Laws, 1939, c. 28.

the original of every prescription compounded or dispensed therein, numbering, dating and filing them in the order in which they were compounded or dispensed, and preserving them for not less than five years. The new law also requires that on the container of a prescription there shall be fixed a label bearing the name and address of the pharmacy wherein compounded, the corresponding serial number of the prescription, the name of the prescriber, his directions, the name of the patient and the date and initials of the registered pharmacist who compounded the prescription.

Various bills proposing to amend existing pharmacy practice acts were killed in twenty-three states.⁴⁷⁷

CHIROPODY.—Bills to enact separate chiropody or podiatry practice acts and to provide for the examining and licensing of such practitioners by an independent board of examiners were considered in three states.⁴⁷⁸ Only one state, New Mexico, enacted such a law.⁴⁷⁹ The definition of chiropody in the New Mexico law seems extremely broad. Chiropody is defined as "The diagnosis and the medical, surgical, mechanical, manipulative and electrical treatment of ailments of the human foot excepting amputation of the foot or toes or the administration of an anesthetic other than local."

The Alabama medical practice act was so amended this year⁴⁸⁰ as to authorize the state board of medical examiners to license persons to practice chiropody. Such practitioners, however, are authorized to diagnose only local ailments of the human foot and to treat such ailments only locally, extending treatment no deeper than the true skin and using only local anesthetics in connection with such treatment. Applicants for such a license must possess such qualifications and submit to such examinations as in the judgment of the board of medical examiners are necessary for the protection of the public health. Such examinations must embrace the anatomy and physiology of the foot; the diagnosis and treatment of diseases and ailments of the foot, aseptis, antisepsis, therapeutics and clinical chiropody.

Amendments to existing chiropody practice acts were adopted in Connecticut,⁴⁸¹ Delaware,⁴⁸² Florida,⁴⁸³ Illinois,⁴⁸⁴ Michigan,⁴⁸⁵ Minnesota,⁴⁸⁶ Montana⁴⁸⁷ and Texas.⁴⁸⁸ One of the new Illinois laws⁴⁸⁹ requires all applicants for such licenses to be citizens of the United States. The laws adopted in Michigan, Montana and Texas, among other things, seem to extend the scope of a license to practice chiropody. The new Michigan law seems to permit such practitioners to treat ailments of the human foot by physiotherapy. The new Montana law states that chiropody is "the diagnosis, medical, surgical, mechanical, manipulative and electrical treatment of ailments of the human foot" but prohibits chiropodists from amputating the human foot or toes or from administering any anesthetic other than local. The new Texas law permits such licentiates to

treat ailments of the human foot by any system or method, either medical, surgical, mechanical, manipulative or massage, physiotherapy, mechanotherapy, electrical appliance or other system or method but prohibits a chiropodist from amputating the human foot or toe or from administering any anesthetic other than local. The new Delaware law⁴⁹⁰ purports to raise the educational qualifications of chiropody applicants by requiring them to present proof that they have obtained a doctor's degree in chiropody after graduating from an accredited college or university, which requires as a prerequisite to graduation a four year course of instruction in chiropody, consisting of at least eight months of instruction a year and a total of at least 3,980 hours of instruction for the four year course.

A new California law⁴⁹¹ requires chiropody applicants to have completed a one year resident course of work of college grade in a school approved by the board of medical examiners before commencing the resident course of study in chiropody.

An unsuccessful attempt was made to repeal the chiropody practice act of Tennessee.⁴⁹²

Unsuccessful attempts were made in seven states to amend existing laws regulating the practice of chiropody.⁴⁹³

OPTOMETRY.—New optometry practice acts were enacted this year in Florida⁴⁹⁴ and Wyoming.⁴⁹⁵ The new Florida law defines optometry as "the diagnosis of the human eye and its appendages, and the employment of any objective or subjective means or methods for the purpose of determining the refractive powers of the human eyes, or any visual, muscular, neurological or anatomic anomalies of the human eyes and their appendages, and the prescribing and employment of lenses, prisms, frames, mountings, orthoptic exercises, light frequencies and any other means or methods for the correction, remedy, or relief of any insufficiencies or abnormal conditions of the human eyes and their appendages." The law also requires courts and governmental agencies to accept the testimony and services of optometrists on the same basis, and on a parity "with any other person or persons authorized by law to render similar professional service." The new Wyoming law defines optometry as "the employment of any means other than the use of drugs for the measurement of the powers or range of human vision or the determination of the accommodative and refractive status of the human eye or the scope of its functions in general or the adaptation of lenses or frames for the aid thereof." The new law specifically prohibits an optometrist from using the title "oculist" or "ophthalmologist" or any other word or abbreviation indicating that he is engaged in the treatment of diseases of or injuries to the human eye, or possesses the right to use drugs or medicine in any form for the treatment or examination of the human eye.

Amendments to existing optometry practice acts were adopted in Arkansas,⁴⁹⁶ California,⁴⁹⁷ Connecticut,⁴⁹⁸ Delaware,⁴⁹⁹ Illinois,⁵⁰⁰ Kansas,⁵⁰¹ Maine,⁵⁰²

477. Calif. S. 818, S. 819; Conn. H. 1511; Fla. H. 1576, H. 264, H. 265; Ga. H. 682; Ill. H. 752; Iowa S. 193, S. 195, S. 194, S. 398, S. 399; Mass. H. 69, H. 1655, H. 1656, H. 1787; Mich. S. 317, H. 272; Mo. S. 306, H. 389; Nev. A. 20; N. J. S. 15, A. 266; N. M. H. 83; N. Y. S. 1774, A. 2257; N. C. H. 311, H. 566; Okla. S. 75, S. 170, H. 426; Ore. H. 9; Tenn. S. 386; Texas S. 166, H. 453; Utah H. 269; Va. H. 367; Wash. H. 507; Wis. A. 443, A. 718, A. 877; Wyo. H. 30.

478. N. M. Laws, 1939, c. 17.

479. Ala. Laws, 1939, Gov. No. 448.

480. Conn. Laws, 1939, c. 53.

481. Del. Laws, 1939, c. —, approved May 1, introduced as H. 171;

482. approved May 1, introduced as H. 170.

483. Fla. Laws, 1939, c. 19173, c. 19104.

484. Ill. Laws, 1939, p. 709, p. 713.

485. Mich. Acts, 1939, Pub. Act No. 221.

486. Minn. Laws, 1939, c. 160.

487. Mont. Laws, 1939, c. 218.

488. Texas Laws, 1939, c. —, approved July 11, introduced as H. 195.

489. Ill. Laws, 1939, p. 702.

490. Del. Laws, 1939, c. —, approved May 1, introduced as H. 171.

491. Calif. Laws, 1939, c. 1021.

492. Tenn. H. 183.

493. Calif. S. 1034, A. 531, A. 532; Fla. H. 393, H. 394, Mo. H. 533, H. 534, H. 535, H. 577, H. 578, H. 579; Nev. A. 23, S. 64; Tenn. H. 184; W. Va. H. 189; Wyo. H. 125.

494. Fla. Laws, 1939, c. 19331.

495. Wyo. Laws, 1939, c. 63.

496. Ark. Acts, 1939, Act No. 109.

497. Calif. Laws, 1939, c. 570.

498. Conn. Laws, 1939, c. 114, c. 366.

499. Del. Laws, 1939, c. —, approved April 12, introduced as S. 93.

500. Ill. Laws, 1939, p. 718.

501. Kan. Laws, 1939, c. —, approved March 20, introduced as H. 222.

502. Me. Public Laws, 1939, c. 29.

Montana,⁵⁰³ Nevada,⁵⁰⁴ New Hampshire,⁵⁰⁵ New Mexico,⁵⁰⁶ New York,⁵⁰⁷ Tennessee⁵⁰⁸ and Texas.⁵⁰⁹ As a general rule, the amendments are not of sufficient interest to warrant discussion here. However, the new Illinois law⁵¹⁰ and one of the laws adopted in New Hampshire⁵¹¹ require applicants for licenses to be citizens of the United States. The new laws adopted in Montana and Tennessee, among other things, prohibit optometrists from advertising the prices for which they will render services or supply materials. The new New Mexico law broadens the prior definition of optometry by defining it as "the employment of an [sic] subjective or objective means or methods, other than the use of drugs or surgery, for the purpose of determining the refractive condition of the human eye or any muscular or visual anomalies thereof; or the employment, adapting or prescribing of lenses, prisms, or other optical appliances, or other means, modalities or methods, not including drugs, medicines or surgery for the correction or relief of disturbances in and anomalies of the human visual system and its supportive functions."

The new Arkansas law declares the practice of optometry to be a learned profession [sic] and states that the same rights and powers attach thereto as to the other learned professions. The law defines optometry as "the employment of any method or means other than the use of drugs, medicine or surgery, for the analysis of any optical defect, deficiency, or deformity, visual or muscular anomaly of the visual functions, or the use of scientific instruments to train the visual system."

Unsuccessful attempts were made to amend the optometry practice act in twenty-three states.⁵¹²

OPTICIANS—OPHTHALMIC DISPENSING.—A new California law⁵¹³ provides a practice act for dispensing opticians. The law requires registration with the board of medical examiners of individuals and firms filling prescriptions of physicians and surgeons licensed by the board of medical examiners for ophthalmic lenses and kindred products, and, as incidental to the filling of such prescriptions, taking facial measurements and fitting and adjusting lenses or frames. The law is not to affect any licensed optometrist or physician and surgeon but the exemption is not to apply to any optometrist or physician exclusively engaged in the business of filling prescriptions for physicians and surgeons.

Bills were killed in California,⁵¹⁴ proposing a practice act for persons engaged in optical dispensing and limiting optical dispensing to persons licensed to do so by the board of optometrical examiners.

Optician practice acts were considered and killed in Massachusetts,⁵¹⁵ Pennsylvania⁵¹⁶ and New York⁵¹⁷ which proposed to establish independent boards of optician examiners.

503. Mont., Laws, 1939, c. 130.

504. Nev., Laws, 1939, c. 79.

505. N. H., Laws, 1939, c. —, approved June 16, introduced as H. 437, c. —, approved June 17, introduced as H. 59.

506. N. M., Laws, 1939, c. 166.

507. N. Y., Laws, 1939, c. 916.

508. Tenn., Public Acts, 1939, c. 90.

509. Texas, Laws, 1939, c. —, approved June 30, introduced as H. 410.

510. Ill., Laws, 1939, p. 718.

511. N. H., Laws, 1939, c. —, approved June 16, introduced as H. 437.

512. Ark. S. 480; Calif. A. 1720; Colo. S. 464; Del. S. 94; Ga. S. 166,

H. 432; Ida. H. 151; Ill. S. 457; Iowa H. 594; Md. S. 257; Mass.

H. 1405, H. 1406; Mo. S. 280; Neb. Bill. 433; N. H. H. 125; N. J.

A. 128, A. 639; N. Y. A. 1988, S. 2118; N. C. H. 881, H. 1087;

N. D. H. 340; Ohio S. 114, S. 134; Ore. S. 70; Pa. S. 685, H. 717,

H. 966; R. I. H. 803; Texas S. 38; Wash. H. 482.

513. Calif., Laws, 1939, c. 955.

514. Calif. S. 1226, A. 1666.

515. Mass. H. 668.

516. Pa. H. 410, H. 973.

517. N. Y. S. 589.

VII. BILLS AFFECTING HOSPITALS

A. Hospitals Generally

CONTRACTS FOR HOSPITALIZATION; HOSPITALIZATION INSURANCE.—Legislation to authorize the formation of corporations to provide on a "nonprofit basis," "hospital care" to their members and subscribers have been discussed in this survey on page 876.

LIENS FOR HOSPITALS.—Laws were enacted in Illinois,⁵¹⁸ Kansas⁵¹⁹ and Rhode Island⁵²⁰ granting liens to all hospitals treating persons injured through the negligence of others on all claims, rights of action, settlements, judgments or compromises accruing to the injured persons because of their injuries.

Similar bills were killed in six other states.⁵²¹

The New York law granting hospital liens of this type was amended this year⁵²² so as to provide that the fee for filing a claim of lien in the counties comprising the city of New York shall be 50 cents and that the fee for filing a discharge of lien in those counties shall be \$1.

Unsuccessful attempts were made to amend the New York hospital lien act in other particulars.⁵²³ Attempts likewise failed in three other states⁵²⁴ to amend existing hospital lien acts.

PAYMENT BY STATE FOR HOSPITAL CARE.—Unsuccessful attempts were made in four states⁵²⁵ to provide a procedure whereby hospitals might be reimbursed by the state for care and treatment rendered indigents injured in motor vehicle accidents.

Proposals were killed in New York⁵²⁶ and North Carolina⁵²⁷ to require applicants for automobile licenses to pay stated additional fees to establish a fund which was to pay the hospitalization expenses of persons injured in motor vehicle accidents.

FACILITIES AVAILABLE TO CULTISTS.—Proposals to require all private hospitals, or certain types of private hospitals, to permit any licensed practitioner of the healing art to treat patients within their confines has been discussed in this survey on page 972.

LICENSING OF ALL PRIVATE HOSPITALS.—Bills to require the annual licensing of all private hospitals by specified state agencies were killed in five states.⁵²⁸

HOSPITAL EMPLOYEES.—Bills to limit the hours of employment in hospitals of nurses to not more than eight hours a day were killed in three states.⁵²⁹

REPORTING OF WOUNDS, INJURIES AND DEFECTS.—Legislation proposing to require hospitals to report the status of wounds, injuries and defects, has been considered in this survey on page 974.

PAYMENT OF SALARIES TO INTERNS.—An unsuccessful attempt was made in Pennsylvania⁵³⁰ to require all hospitals receiving appropriations from the commonwealth to pay each intern an annual salary of not less than \$1,000.

518. Ill., Laws, 1939, p. 700 (similar bills were S. 371 and H. 978, which failed of enactment).

519. Kan., Laws, 1939, c. —, approved March 30, introduced as H. 509.

520. R. I., Laws, 1939, c. 709.

521. Ga. H. 526; Me. H. 1416; Mo. S. 22; S. C. S. 325; S. D. S. 25;

Tenn. H. 758.

522. N. Y., Laws, 1939, c. 290.

523. N. Y. A. 755, A. 1400, S. 1349, A. 2028.

524. Del. S. 253; Ind. H. 224; Ore. S. 353.

525. Minn. S. 1289 and H. 1454; Neb. Bill. 476; Ore. H. 415;

Pa. H. 1409.

526. N. Y. A. 1280.

527. N. C. S. 185.

528. Ark. H. 101, H. 335, H. 366; Ill. H. 110; Mass. H. 852; Pa.

H. 727, S. 545; Texas H. 176.

529. Conn. S. 290; Mont. H. 321; N. Y. A. 1585 (this bill applied to

all hospital employees).

530. Pa. H. 682.

HOSPITAL RECORDS.—A bill was killed in New York⁵³¹ to make hospital records or copies thereof, when certified by an officer in charge of the hospital, admissible as evidence in courts of record, provided only that any declarations or statements contained in said record made by an injured party of a non-medical nature or which are explanatory or descriptive of the occurrence, happening or accident in question, were not to be admissible. A California bill, which was killed,⁵³² proposed to require hospitals to keep records on file for at least three years after the patient had been discharged and to permit the patient or his representative to inspect the records and make copies thereof.

MISCELLANEOUS.—A new South Carolina law⁵³³ provides a penalty for any person who operates a radio or other musical instrument in such a manner that it disturbs any patient confined to a hospital or sanatorium. A law enacted in Massachusetts⁵³⁴ prohibits employees and persons connected with hospitals from furnishing information about personal injury cases to attorneys or their representatives.

LIABILITY OF CHARITABLE HOSPITALS FOR NEGLIGENCE OF EMPLOYEES.—The Illinois senate rejected a proposal⁵³⁵ that corporations not for pecuniary profit shall be liable for the negligence of their officers, agents and servants in the course of their authorized duties and employment.

THE PRACTICE OF MEDICINE BY HOSPITALS.—An unsuccessful Missouri bill⁵³⁶ proposed, in effect, to permit hospitals to practice medicine through the agency of physicians, osteopaths and dentists in their employ.

SUPPLYING OF OXYGEN TENTS BY STATE.—Two bills were killed in Massachusetts⁵³⁷ proposing to require the state to furnish oxygen tents to stated types of hospitals.

LIABILITY FOR INJURIES OR DISEASES OF EMPLOYEES.—An unsuccessful attempt was made to amend the Pennsylvania workmen's compensation act⁵³⁸ so as to make compensable as an occupational disease a contagious disease of any kind contracted by a person employed in or about any hospital where persons having contagious diseases are admitted for treatment. Unsuccessful attempts were made in New York⁵³⁹ to include within the workmen's compensation act employment in hospitals.

B. Particular Types of Private Hospitals

MATERNITY HOSPITALS.—A new law was adopted in Oregon⁵⁴⁰ prohibiting the operation of a maternity hospital or other place for the reception, care and treatment of women during pregnancy or within ten days after delivery unless licensed by the state board of health.

Similar bills were killed in North Dakota⁵⁴¹ and Utah.⁵⁴²

The Illinois law regulating the operation of maternity hospitals was amended this year⁵⁴³ in several particulars. Most important is a requirement that such a hospital to be licensed or to retain licensure must possess equipment necessary for its purpose and must be safe and sanitary. No such hospital is permitted to place a child for adoption or care unless it is licensed as a child welfare agency.

An unsuccessful attempt was made so to amend the Colorado law⁵⁴⁴ relating to the supervision and licensing of child welfare agencies, boarding homes and maternity hospitals.

C. Governmental Hospitals

FACILITIES AVAILABLE TO CULTISTS.—Legislative proposals to require governmental hospitals to permit any licensed practitioner of the healing art to treat patients within their confines have been discussed in this survey on page 972.

STATE HOSPITALS FOR THE TREATMENT OF TUBERCULOSIS.—A new North Carolina law⁵⁴⁵ authorizes the establishment in eastern North Carolina of a sanatorium for the treatment of persons afflicted with tuberculosis.

Bills to authorize either the establishment of a state hospital for the treatment of tuberculosis or additional hospitals for such purposes were killed in four states.⁵⁴⁶

STATE HOSPITALS FOR THE INSANE.—Unsuccessful attempts were made in two states⁵⁴⁷ to authorize the establishment and operation of additional state hospitals for the care, treatment and maintenance of insane persons. An unsuccessful attempt was made in Wisconsin⁵⁴⁸ to require the establishment of a chiropractic ward in a stated state hospital for the insane.

STATE PSYCHIATRIC OR PSYCHOPATHIC HOSPITALS OR CLINICS.—Laws were enacted in California,⁵⁴⁹ Delaware⁵⁵⁰ and Vermont⁵⁵¹ authorizing the establishment and operation of state psychiatric or psychopathic hospitals or clinics. The new California law provides for the operation in existing state institutions of units for the custodial care and treatment of defective or psychopathic delinquents of both sexes. The new Delaware law directs the board of trustees of the Delaware State Hospital at Farnhurst to establish a psychiatric observation clinic for the observation, study, psychiatric diagnosis and treatment of persons suffering from mental and nervous diseases. The new Vermont law establishes within the Department of Public Welfare a psychiatric clinical division which is to provide adequate local and traveling clinics at such places and at such times as will economically and efficiently examine (1) children under the supervision and jurisdiction of the public welfare department; (2) dependent, neglected or delinquent children against whom court proceedings have been instituted, and (3) children against whom complaints or petitions have been made to the state probation officer. Judges are authorized to commit children on the facts indicated to such clinics for examination and receive the results of the examinations and recommendations before passing sentence.

STATE CANCER HOSPITALS.—Unsuccessful attempts were made in Arkansas⁵⁵² to establish an institute for the hospitalization and treatment of persons suffering from cancer. The bills proposed that persons able to pay only a part of the expenses of necessary treatment might be admitted under such regulations as may be established by the board of trustees of the proposed institute.

STATE ORTHOPEDIC HOSPITALS.—Unsuccessful attempts were made in two states⁵⁵³ to establish hospitals for the prevention, treatment and cure of infantile paralysis. A proposal was rejected in California⁵⁵⁴ to establish a number of crippled children hospital districts to provide special care and treatment

531. N. Y. A. 269.

532. Calif. A. 1727.

533. S. C. Laws, 1939, Gov. No. 543.

534. Mass. Laws, 1939, c. 497.

535. Ill. S. 332.

536. Mo. S. 68.

537. Mass. H. 2206, H. 1265.

538. Pa. H. 440.

539. N. Y. A. 1238, S. 914.

540. Ore. Laws, 1939, c. 494.

541. N. D. H. 154.

542. Utah S. 85.

543. Ill. Laws, 1939, p. 323.

544. Colo. S. 323.

545. N. C. Laws, 1939, c. 325.

546. Idaho H. 374, H. 375, H. 424, Ill. H. 224; Nev. S. 8, N. Y. A. 1417.

547. Fla. S. 306, H. 352, S. 593, H. 205, Ia. H. 100.

548. Wis. S. 142.

549. Calif. Laws, 1939, c. 697.

550. Del. Laws, 1939, c. —, approved April 24, introduced as H. 76.

551. Vt. Laws, 1939, c. —, approved April 13, introduced as H. 297.

552. Ark. H. 428, H. 312.

553. Mont. H. 249, Wyo. H. 74.

554. Calif. A. 233.

and physical rehabilitation for physically defective and handicapped children under 18.

STATE HOSPITALS FOR THE TREATMENT OF INEBRIATES.—A new California law ⁵⁵⁵ directs the Director of Institutions, with the approval of the state board of control, to provide suitable units to be used for the isolation and rehabilitation of chronic inebriates. The law provides a procedure whereby inebriates may be committed to the state inebriate colonies by appropriate courts.

A bill in Massachusetts ⁵⁵⁶ was referred to the next session of the legislature which proposed to provide at state expense for the care and treatment of inebriates for a period of not exceeding six months each per person so treated.

STATE HOSPITALS FOR THE CARE AND TREATMENT OF INCURABLE CHILDREN.—Unsuccessful attempts were made in Florida ⁵⁵⁷ to authorize the state board of health to establish a home for the care and treatment of incurable children.

STATE HOSPITALS FOR THE TREATMENT OF BUERGER'S DISEASE.—A new Washington law ⁵⁵⁸ authorizes the establishment at Soap Lake of an institution to be known as the McKay Memorial Research Hospital, for the treatment and care of persons afflicted with Buerger's disease, and for experimental and scientific study of such diseases and the medicinal and curative properties of the waters of Soap Lake.

COUNTY GENERAL HOSPITALS.—Laws were enacted in Alabama ⁵⁵⁹ Florida, ⁵⁶⁰ Iowa, ⁵⁶¹ Kansas ⁵⁶² and South Carolina ⁵⁶³ authorizing the establishment of county hospitals in stated counties in the states in question. The new Alabama law authorizes the establishment and operation of a county hospital in Cullman County. One of the Florida laws ⁵⁶⁴ provides for the establishment of a county general hospital in counties of from 9,000 to 11,000 population, while the other Florida laws authorize the establishment of such hospitals in Jackson, Leon, Pasco and Putnam counties. The Iowa law authorizes such hospitals in any county having a population of 135,000 or more. The Kansas law applies to a county of from 100,000 to 140,000 population containing a city of from 90,000 to 115,000 population. The first South Carolina law cited authorizes the establishment in the county of Charleston of such a hospital which can serve not only charitable patients but also pay patients at such rates as are commensurate with the ability of the patient to pay. The other South Carolina law authorizes a county hospital in Colleton County.

A new Wyoming law ⁵⁶⁵ permits county hospitals to treat pay patients at such rates as the hospital boards deem equitable.

A bill to accomplish a similar purpose was killed in California. ⁵⁶⁶

555. Calif., Laws, 1939, c. 994.

556. Mass. H. 1836.

557. Fla. H. 577, S. 272.

558. Wash., Laws, 1939, c. 46.

559. Ala., Laws, 1939, Gov. No. 226.

560. Fla., Laws, 1939, c. —, Law Without Approval, June 12, introduced as H. 2014; c. —, approved May 20, introduced as H. 780; c. —, Law Without Approval June 12, introduced as S. 988; c. —, approved May 19, introduced as H. 1140; c. —, Law Without Approval June 12, introduced as S. 1106.

561. Iowa, Laws, 1939, c. 143.

562. Kan., Laws, 1939, c. —, approved April 3, introduced as H. 454.

563. S. C., Laws, 1939, Gov. No. 162, Gov. No. 686.

564. Fla., Laws, 1939, c. —, Law Without Approval June 12, introduced as H. 2014.

565. Wyo., Laws, 1939, c. 88.

566. Calif. A. 2499.

COUNTY TUBERCULOSIS HOSPITALS.—A new North Carolina law ⁵⁶⁷ authorizes counties to establish and operate hospitals for the treatment of tuberculosis.

An unsuccessful attempt was made in Texas ⁵⁶⁸ to authorize the board of county commissioners of any county having a population of more than 30,000 to establish and operate a hospital for the treatment of tuberculosis.

DISTRICT TUBERCULOSIS HOSPITAL.—A new Illinois law ⁵⁶⁹ sets forth the procedure whereby any two or more contiguous counties may be incorporated as a tuberculosis sanatorium district and may establish and maintain a tuberculosis sanatorium, and branches, dispensaries and other auxiliary institutions connected with it within the limits of the district.

MUNICIPAL HOSPITALS.—A new Minnesota law ⁵⁷⁰ authorizes any city of from 2,700 to 2,800 population to establish and operate a general hospital.

Two other proposals were killed, however, in Minnesota ⁵⁷¹ to authorize the governing board of any village or city to cause a special election to be held for the establishment and maintenance of a municipal hospital. If the election was favorable, the bill authorized the establishment and operation of such a hospital.

A new Kansas law ⁵⁷² permits a particular city with a population of from 3,750 to 4,300 and located in a county of from 16,000 to 21,000 population to establish a city hospital.

VIII. WORKMEN'S COMPENSATION LEGISLATION

A. New Act

A law was enacted in Arkansas ⁵⁷³ providing compensation for employees for disability or death resulting from accidental injuries arising out of and in the course of employment and such occupational disease or occupational infection as arises naturally out of such employment or as naturally or unavoidably result from such accidental injury. The employer must furnish to the disabled workmen "such medical, surgical or other attendance or treatment, nurse and hospital service, medicine, crutches, and apparatus as may be necessary during sixty days after the injury or for such time in excess thereof as in the judgment of the [Workmen's Compensation] Commission may be required." Apparently, the injured workman is to be entitled to select his own physician only if an employer fails or neglects to provide one or in the case of emergency. The law specifically provides that a person rendering medical, surgical or other attendance or treatment, nurse or hospital service or emergency treatment must submit his proposed charges to the commission for its approval.

The new law is subject to a statewide referendum in November 1940, and its operation is suspended subject to the outcome of that referendum.

B. Changes in Present Compensation Acts

INJURIES COMPENSABLE.—New occupational disease compensation acts were enacted in Idaho, ⁵⁷⁴ Maryland ⁵⁷⁵ and Pennsylvania. ⁵⁷⁶ The new Idaho law pro-

567. N. C., Laws, 1939, c. 293.

568. Texas H. 245.

569. Ill., Laws, 1939, p. 483.

570. Minn., Laws, 1939, c. 254.

571. Minn., S. 68, H. 49.

572. Kan., Laws, 1939, c. —, approved April 3, introduced as H. 342.

573. Ark., Laws, 1939, Act 319 (S. 41, H. 222 and S. 426, somewhat similar bills, were also considered but failed of enactment).

574. Idaho, Laws, 1939, c. 161.

575. Md., Laws, 1939, c. 465.

576. Pa., Acts, 1939, Act. No. 284.

vides compensation for some eleven stated types of occupational disease while the new Pennsylvania and Maryland laws respectively provide compensation for some twelve and thirty-four stated types of occupational disease. The new Maryland law sets up a medical board to consist of three physicians to be appointed by the governor, whose duty it is to pass on all claims for compensation for occupational disease and to conduct such physical and x-ray examinations of claimants as it deems necessary and to certify its findings to the state industrial accident commission.

Provisions of the workmen's compensation acts of Minnesota,⁵⁷⁷ Ohio⁵⁷⁸ and Washington⁵⁷⁹ providing compensation for stated occupational diseases were amended this year. The new Ohio law extends the list of occupational diseases which are compensable and in effect makes compensable all diseases arising out of employment. The new Minnesota law adds to the list of compensable occupational diseases "the following occupational diseases due to the hazards of fire fighting, myocarditis, coronary sclerosis, and pneumonia or its sequelae in firemen." The new Washington law provides compensation under stated circumstances for asbestosis, silicosis (including anthracosilicosis and silicotuberculosis) and any respiratory disease contracted through the inhalation of dust.

A bill was killed in Oregon⁵⁸⁰ proposing to make compensable all occupational diseases arising out of and in the course of employment. Bills to extend the list of compensable occupational diseases or to make stated occupational diseases compensable were killed in Delaware,⁵⁸¹ Georgia,⁵⁸² Montana⁵⁸³ and Pennsylvania.⁵⁸⁴ Unsuccessful attempts were made in New York⁵⁸⁵ to include within the workmen's compensation act employment in hospitals.

MEDICAL AND HOSPITAL AID.—Laws increasing the amount of medical, surgical and hospital aid to be rendered an injured employee at the employer's expense were enacted in Arizona,⁵⁸⁶ New York,⁵⁸⁷ North Dakota,⁵⁸⁸ South Dakota⁵⁸⁹ and Texas.⁵⁹⁰ The new Arizona law provides for such medical and hospital services as are reasonably required to be rendered the injured employee. The prior law limited this care to the first ninety days after the industrial accident. The new New York law enables an employee disabled by an occupational disease resulting from the inhalation of harmful dust to receive at the expense of the employer medical treatment for a period of up to 270 days. The new North Dakota law requires the state fund to furnish an injured employee such medical, surgical and hospital services and supplies as the nature of the injury may require and such artificial limbs, glasses, braces or appliances as may be necessary to rehabilitate the employee. The new South Dakota law raises to \$300 the maximum liability of an employer for medical and hospital services rendered an injured workman and extends the period after the industrial accident during which the employer must provide such services to twenty weeks. The new Texas law requires an

employer's insurer to provide medical and hospital services to an injured workman where needed up to ninety-one days from the date of the injury and in hospital cases, and if the attending physician certifies to the necessity thereof hospital services must be provided for two weeks longer.

Bills to increase the amount of medical, surgical and hospital aid to be rendered an injured employee at the employer's expense were killed in four other states.⁵⁹¹

RIGHT OF EMPLOYEES TO CHOOSE PHYSICIANS.—Bills were killed in six states⁵⁹² which proposed to permit an injured employee to select the physician whom he desires to treat him for his industrial injuries and to make the employer liable for such medical and surgical aid as that physician deems reasonable or necessary.

EMPLOYERS' LIABILITY FOR CULTISTS' TREATMENT.—Bills were considered and killed in five states⁵⁹³ to amend respective workmen's compensation acts so as to permit osteopaths or cultists to render the required "medical" attention to injured employees.

IX. MISCELLANEOUS LEGISLATION

LABORATORIES.—Laws regulating the operation of stated types of laboratories were enacted in Maryland⁵⁹⁴ and Massachusetts.⁵⁹⁵ The new Maryland law authorizes the state board of health to establish such a minimum standard as it considers necessary for laboratories in the state, except in Baltimore, which make examinations in connection with the diagnosis and control of human diseases. The new Massachusetts law authorizes the department of public health to issue on request certificates of approval to bacteriologic laboratories and to specify in the certificates what bacteriologic or serologic procedures performed in such laboratories are approved by the department.

A new California law⁵⁹⁶ repealed the prior law regulating the production and distribution of serums, vaccines, bacterial cultures and viruses and enacted a new act prohibiting the production of such substances except in laboratories licensed either by the state department of health, the U. S. Public Health Service or the Bureau of Animal Industry of the U. S. Department of Agriculture.

BLOOD GROUPING TESTS.—Laws were enacted in Maine,⁵⁹⁷ New Jersey⁵⁹⁸ and Ohio⁵⁹⁹ providing that whenever it is relevant in a proceeding involving the parentage of a child, the trial court may direct the mother, the child and the defendant to submit to one or more blood grouping tests to determine whether or not the defendant can be excluded from the probability of being the father of the child. The results of such tests are to be admissible only in cases in which exclusion is established.

Similar bills were killed in two other states.⁶⁰⁰

The New York law permitting a court whenever it is relevant to the prosecution or defense of an action to direct any parties to the action and the child of any such party and the person involved to submit to one or

577. Minn. Laws, 1939, c. 306.

578. Ohio, Laws, 1939, c. —, approved May 26, introduced as S. 297.

579. Wash., Laws, 1939, c. 135.

580. Ore. H. 403.

581. Del. H. 141.

582. Ga. H. 399.

583. Mont. H. 180.

584. Pa. H. 440.

585. N. Y. A. 1238, S. 914.

586. Ariz., Laws, 1939, c. 28.

587. N. Y., Laws, 1939, c. 676.

588. N. D., Laws, 1939, c. 251.

589. S. D., Laws, 1939, c. 297.

590. Texas, Laws, 1939, c. —, approved May 1, introduced as S. 152.

591. Del. S. 177; Ind. H. 225; Mich. S. 419, H. 559; Tenn. S. 305, H. 1174; S. 1003, H. 1385; H. 504.

592. Calif. A. 1515; Conn. H. 150; Ga. H. 227; Mich. S. 419, H. 559; Texas H. 465, H. 489, H. 695; Wis. A. 55.

593. Calif. A. 2177; Minn. H. 234; Ore. S. 311; Wash. S. 83, H. 702; Wis. A. 55, A. 411.

594. Md., Laws, 1939, c. 256.

595. Mass., Laws, 1939, c. 344.

596. Calif., Laws, 1939, c. 910.

597. Me., Public Laws, 1939, c. 259.

598. N. J., Laws, 1939, c. 221.

599. Ohio, Laws, 1939, c. —, approved June 2, introduced as H. 215.

600. Calif. A. 1246; Minn. H. 84, H. 85.

more blood grouping tests was so amended this year⁶⁰¹ as also to permit a court to order such a test "wherever it shall be relevant in any proceeding pending in a court of record."

TRAFFIC CODES—ADMISSIBILITY OF BLOOD TEST TO PROVE OR DISPROVE INTOXICATION.—Laws were enacted in Indiana⁶⁰² and Maine⁶⁰³ making admissible in the trial of any person accused of operating a motor vehicle while intoxicated evidence of the percentage by weight of alcohol in his blood at the time of the alleged commission of the offense. The Indiana law provides that evidence that there was at the time in question 0.05 per cent, or less, by weight of alcohol in the blood is *prima facie* evidence that the defendant was not under the influence of intoxicating liquor sufficiently to lessen his driving ability. Evidence that there was, at that time, from 0.05 per cent to 0.15 per cent is relevant evidence but is not to be given *prima facie* effect as to intoxication. Evidence, however, that there was at that time, 0.15 per cent, or more, is *prima facie* evidence that the defendant was under the influence of intoxicating liquor sufficiently to lessen his driving ability. The Maine law is quite similar in this regard except that it states that evidence of 0.07 per cent, or less, by weight of alcohol is *prima facie* evidence that the defendant was not under the influence of intoxicating liquor and that evidence of from 0.07 per cent to 0.15 per cent is relevant evidence but is not *prima facie* evidence as to intoxication.

Bills similar to the Indiana law were rejected in Florida⁶⁰⁴ and Illinois.⁶⁰⁵

CORONERS AND MEDICAL EXAMINERS.—A new Maryland law⁶⁰⁶ repeals the prior law relating to coroners and creates a new executive and administrative department to be known as the Department of Post Mortem Examiners, the head of which is to be a commission consisting of the professors of pathology of the University of Maryland and of Johns Hopkins University, the director of health of the state, the commissioner of health of Baltimore city and the attorney general. This commission is authorized to appoint three medical examiners, who must be licensed doctors of medicine and have had at least two years of postgraduate teaching in pathology. The commission is also authorized to appoint a deputy medical examiner, who also must be a licensed physician, for each county of the state. Whenever any person dies as a result of violence, or by suicide, by casualty, suddenly when in apparent health, when unattended by a physician, or in any suspicious or unusual manner, it is to be the duty of the police or sheriff immediately to notify the chief medical examiner or a deputy medical examiner, who is then to go to the dead body, take charge of it and investigate the essential facts concerning the circumstances of death. If an autopsy is deemed necessary, it must be performed by the chief medical examiner, by the assistant medical examiner or by such competent pathologists as may be authorized by the chief medical examiner.

Unsuccessful attempts were made in Delaware⁶⁰⁷ and Michigan⁶⁰⁸ to abolish the office of coroner and to create a medical examiner system in the state.

The medical examiner laws of Maine,⁶⁰⁹ Massachusetts⁶¹⁰ and Rhode Island⁶¹¹ were amended this year. The Rhode Island amendment provides, among other things, that if the medical examiner believes that a death was caused by the act or neglect of some person other than the deceased he must notify the attorney general and the police of the jurisdiction in which the body was found and must file a copy of the record of his autopsy, or view, with the attorney general. The medical examiner must also in all cases certify to the officer having custody of the records of deaths in the town in which the deceased came to his death the name and residence of the deceased, if known, or, if not known, a description of the deceased together with the cause and manner by and in which he came to his death. The Massachusetts amendment permits a medical examiner to perform an autopsy on any dead body in his county on the written order of the district attorney. The prior law permitted an autopsy only on the body of a person supposed to have died by violence. The Maine amendments increase the number of medical examiners in stated counties and seem to require a medical examiner to obtain the authorization of the county attorney or the attorney general, before performing an autopsy.

Unsuccessful attempts were made to amend the law relating to coroners in four states.⁶¹² One of these bills⁶¹³ proposed to create the office of medical referee for each county in the state. The medical referee was to be a licensed physician whose principal duty it was to determine as to whether it was necessary for the county coroner to hold an inquest on the remains of any deceased person. Another one of the bills⁶¹⁴ proposed to authorize the judges of the superior court to appoint for each county a coroner and a deputy coroner, who must be attorneys at law.

ANIMAL EXPERIMENTATION.—An unsuccessful attempt was made in New Jersey to amend the law relating to vivisection.⁶¹⁵ The bill proposed that the law making it a misdemeanor to inflict unnecessary cruelty on a living animal should not be construed to prohibit or interfere with properly conducted scientific experiments performed under the authority of the state department of health. The present law apparently limits the institutions or societies which the department may authorize to conduct such experiments by stating that the department may authorize such experiments to be conducted by agricultural stations and schools maintained by the state or federal government or by medical societies, universities, colleges and philanthropic institutions incorporated or authorized to do business in the state and having among their corporate purposes investigation into the causes, nature, prevention and cure of diseases.

ASEXUALIZATION.—The legislatures of four states having no compulsory sterilization statutes considered and killed bills seeking to require the sexual sterilization of insane, idiotic or imbecilic inmates of state institutions.⁶¹⁶ One of these bills⁶¹⁷ in addition, provided for the asexualization of persons who had been convicted a second time of a sex crime.

The legislatures of five states having compulsory sterilization laws considered and killed bills to amend or supplement existing sterilization statutes.⁶¹⁸

609. Me., Laws, 1939, c. 241.

610. Mass., Laws, 1939, c. 475.

611. R. I., Laws, 1939, c. 715.

612. Conn. S. 921; Mont. H. 177; Wash. S. 31; Del. H. 129.

613. Mont. H. 177.

614. Conn. S. 921.

615. N. J. S. 318.

616. N. M. H. 109; Ohio H. 565, H. 627; Pa. H. 204, S. 318; Tenn. H. 202.

617. Pa. S. 318.

618. Calif. A. 2112; Nev. A. 178; Utah S. 124; W. Va. H. 268; Wis. A. 436.

601. N. Y., Laws, 1939, c. 647.

602. Ind., Laws, 1939, c. 48.

603. Me., Public Laws, 1939, c. 273.

604. Fla. H. 597.

605. Ill. H. 922.

606. Md., Laws, 1939, c. 369.

607. Del. S. 127.

608. Mich. S. 140.

OFFICIAL NOTES

ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Second Annual Meeting, held in Chicago, Jan. 15 and 16, 1940

(Concluded from page 898)

DR. CLARENCE D. SELBY, Detroit, in the Chair

JANUARY 16—MORNING

PHYSICAL EXAMINATIONS

Objectives of the Health Examination and Their Industrial Application

DR. McIVER WOODY, New York: In 1861, Horace Dobell, of London, came forward with the proposition "that there should be instituted, as a custom, a system of periodical examination, to which all persons should submit themselves, and to which they should submit their children." Little came of Dobell's suggestion, and the whole idea was forgotten for half a century. It was not until the army applied physical examinations on a large scale during the World War that data were available on the physical condition of those gainfully employed. After the World War, periodic examinations were introduced from time to time by certain large industrial organizations. Not too much was expected of them at first, but it was soon found that the examination was of immediate benefit, thanks to the effectiveness of modern treatment.

What is the best routine to follow when it comes to applying the periodic examination in industry? If the employee has been with the company for some years, there will be information concerning him in the files of the medical department. If records of the man's visits to the office are kept in ledger fashion, with a separate sheet for each employee, so that everything of a medical nature pertaining to that one individual can be found in one place, it will be no trouble for the nurse to place the man's folder on the doctor's desk so that he can glance through it rapidly before stepping into the examining room. To provide a favorable atmosphere for an examination that goes beyond the routine search for organic disease, it is advantageous to develop an informal approach, which must prevail from the moment the patient presents himself at the doctor's office. The nurse should let the patient feel that he is expected and very welcome, as she ushers him into the examination room, where he should be given a few minutes of quiet to prepare himself for the interview. I make it a practice to begin the examination by taking the blood pressure, partly because this is something that every layman is interested in and partly because it gives me a good opportunity to put the patient at his ease and inspire his confidence. Even the taking of the pulse I try to do in a way that indicates my personal interest. The examiner may vary the routine in some instances, provided he always carries two things in mind, to omit no essential part of the examination and to give the patient the feeling that this examination is intended solely for his benefit.

While the patient is dressing, the examiner may find it helpful to linger for a few moments while he reviews his observations, but as a rule he should not leave the examining room until he has given the patient a clear idea of the results of the examination and rather definite advice as to what he should or should not do about any defects which may have been brought to light by the check-up. This informal approach to the patient and his problem is more convincing than an impersonal attitude and we believe the patient is more apt to accept advice given him then. The examiner should seek to inspire confidence by the care and thoroughness of the whole procedure, and he should encourage the patient to feel that the physician's entire attention is concentrated on him, without any thought as to other pressing duties.

A man may not welcome the news that an incipient hernia has been discovered, but he is entitled to the information then and there, provided it is told him in a helpful manner. If he is alarmed over the possibility of operation, it may be well

worth while to go into details of what may happen without operation and explain to him the advantages of having the inguinal canal restored to its original size before such a procedure becomes an emergency necessity. This holds true for diseased tonsils, diseased teeth and many other lesser conditions which can be treated successfully by modern dentistry and surgery. The problem is much more complicated when it comes to a question of heart or kidney disease. But even here it is nearly always possible to give the patient a fairly good idea of the health problem with which he is confronted. Indeed, it is surprising to see just how much information can be given a patient with benefit to him, if the subject is approached in a sympathetic spirit. These two instances serve to show that once the man realizes that a periodic examination is of a real benefit to him he will welcome the opportunity to come back year after year, especially if he knows that each time he is examined the observations will be compared with those at previous examinations; that even a slight variation in weight will elicit a certain amount of interest. In this way his interest can be aroused in the general principles of diet, exercise and recreation.

I have been considering the periodic examination mainly from the standpoint of the employee. To the company doctor, periodic examinations can be helpful in several ways. By devoting a few hours of each day to this part of the work, he can follow his cases through the years with a persistence that is beyond the reach of the clinicians in the best teaching hospitals. If the plant physician can give each employee his undivided attention for even fifteen minutes every year, he should be able to build up a personal friendship with them all. This gives the employees a real incentive to report industrial accidents promptly, and even the most trivial accident can have serious consequences in the way of infection, all of which could have been prevented by treatment given immediately after the accident occurred. The same considerations apply in industrial disease. Perhaps the greatest benefits are reaped from this confidence among employees when some unforeseen accident occurs; for it is then that the company doctor, who is thoroughly acquainted with the plant and the men in it, proves his worth. Of course, the employer's interest will be served by anything which benefits the individual employees. The days they are away from the job affect his annual statement just as truly as they do the savings accounts of the employees.

Finally, the plant physician will do well to consider the periodic physical examination as a problem in human engineering. As the engineer who designs a bridge takes care to do his work thoroughly but not in ponderous fashion, so the plant physician must take care not to make his examinations too searching, too prolonged and too theoretical. It might be helpful to mention the engineering rule that "good enough is best." Even though the employer might be willing to have the plant physician set aside more time for each periodic examination, it would not necessarily follow that an examination which took twice as long would be twice as valuable. The attitude of the employees to the examinations is important, for it would defeat their purpose if the employees came to the conclusion that they could not spare the time to be looked over because they had work to do. On the other hand, if the examinations are too superficial they fail to inspire confidence, and again the employees will begin to question whether the examination is worth while. Both extremes must be avoided. If the industrial physician is to be of lasting value in industry, he must think of himself as a medical engineer building the periodic health examination into a strong bridge to span the gap between medical knowledge and its application in industry.

The Private Practitioner and Industrial Physical Examinations

DR. RAYMOND HUSSEY, Baltimore: The physician making an industrial examination is on the lookout for the possible existence of presymptomatic or subclinical conditions and reactive disease, as well as active disease. The decision must be made regarding the fitness of the individual for employment,

and in many instances for a particular employment. So there are fundamental differences in the usual clinical responsibilities of the physician and those he must assume in connection with industrial physical examinations. During a symposium on occupational diseases in 1938 conducted by the Department of Industrial Medicine of the Northwestern University Medical School the subject of industrial physical examinations was presented by Selby; the subject of the relation of the private practitioner to industrial health and safety was presented by Seeger. Among the shortcomings of private practitioners engaged in industrial medical work, attention was called to their lack of knowledge about occupational disease hazards in the plants they serve. As a result of this they have failed in many instances to suggest to the management the desirability of surveying the industrial environment, and they are unable to make recommendations regarding the safety of placing individuals in particular jobs. In spite of this state of affairs, it is brought out that private practitioners furnish services to about 85 per cent of the industrial establishments in the United States and that the work of this group has been essentially case work and basically remedial in nature.

I agree with the criticisms made and I wish to make the following recommendations to improve conditions which provoke them:

1. That opportunities be offered medical students to work during vacation periods in medical departments of industries, just as such vocational opportunities are offered by industry to students of engineering and technical schools.

2. That formal and practical work in industrial hygiene be considered a prerequisite for physicians who expect to include industrial medicine in their practice.

3. That physicians already in industrial medicine cooperate more actively with their state and local health departments in such efforts as are made by those agencies to develop activities in connection with the control and prevention of occupational diseases. In particular that they find a way to comply more fully with any law requiring the reporting of occupational diseases.

4. That state, city and county medical societies should recognize the responsibility of medicine to industry as outlined in the several bulletins published by the Council on Industrial Health of the American Medical Association.

5. That medical societies initiate health examination programs in industry or cooperate with industry, labor and public health agencies in their development.

6. That these societies make an especial effort to bring to the attention of physicians the facts known concerning the silica hazard and the incidence of silicosis, the methods for its control and the pitfalls in its diagnosis.

7. That these representatives of organized medicine initiate movements to improve standards of medical practice in industry. Particularly, that a real effort be made to control medical and legal racketeering in connection with injuries and disease alleged to be a consequence of an occupation.

8. That, in the presentation of diseases which may result from occupational hazards, clinical teachers in our medical schools give more emphasis to the preventive aspects and to the community responsibilities of physicians in these special problems of medical care.

9. That medical schools as far as possible include in their curriculums more adequate instruction in industrial medicine or organize to better advantage what is now included.

Industrial medicine as a special field of interest is much like public health and requires curricular arrangement that more closely allies it with the teaching of preventive medicine in general. Medical school administrators as well as the students themselves have become aware of health hazards in scholastic and hospital work. The entrance requirements of many medical schools give equal emphasis to health and scholastic preparedness. In this manner the preadmission health examination and subsequent reexamination are becoming a matter of established fact and of recognized necessity. This together with improvements in methods of teaching anatomy and physiology

and the development of clinics for the first and second year medical students where health is given emphasis will have a decisive influence in developing a point of view and an attitude for the student to understand the requirements of industrial medicine.

I believe that private practitioners will rise to the occasion when the demand is made for their services to participate in a program of health examinations for industry. At times, when there has been a general mobilization of our armed forces, private practitioners have adapted themselves quickly and efficiently to the requirements of military medicine, and I see no reason to think that they will do differently in the case of industrial medicine.

The problem of reemployment following temporary disabling illness deserves careful consideration. It is interesting to speculate on how the results of a wide scale physical examination program among industrial employees will influence the unemployment problem. Interesting also is the thought of how the results may affect rehabilitation programs and facilities.

A word about the examination: Fluoroscopic examinations and x-ray films of the chest should be required. Each examination should be divided among several medical men, each one of whom will be responsible for a particular part of the examination. Also I would stress the fact that physical-mental relationships must be kept in the foreground, since fitness for work and living depend equally on mental and physical health.

The Wisconsin Program of Preemployment and Medical Examination Procedure

MR. HARRY A. NELSON, Madison, Wis.: The Wisconsin statute required that employers should furnish employment and places of employment which should be safe for employees, should furnish and use safety devices and safeguards, should adopt and use methods and processes reasonably adequate to render employment and places of employment safe, and should do "every other thing reasonably necessary to protect the life, health, safety and welfare of such employees and frequenters." Further, employees should not remove, displace, damage, destroy or carry off any safety device or safeguard furnished nor interfere with their use, nor should they interfere with the use of any method or process adopted for the protection of employees "nor fail or neglect to do every other thing reasonably necessary to protect the life, health, safety or welfare of such employees or frequenters."

Different interpretations were given to safety statutes by the courts. Those courts which gave liberal interpretations from the standpoint of workers held not only that the physical equipment of the plant was required to be maintained in a safe condition but also that the workers themselves should be so chosen and supervised as to comply with the safe place and safe method statutes.

When analysis is made of statistical data covering accidents, it is observed that many of them occur because of the failure of the human factor. When we ask as to the manner in which this human element of unsafety is to be eradicated, we conclude that the least that can be done is to examine the worker at the time he enters employment and to reexamine him at reasonable intervals. Labor organizations have from time to time raised their voices against physical examinations of their members. Their protest has not been entirely without foundation. Happily, the vast majority of employers, and increasingly so, have exhibited sympathy and beneficence, if not always intelligence, toward their employees, sometimes even to the point of doing them harm by putting disabled persons in positions where they should not be. A middle course is indicated which will avoid prejudice to employees and reasonably safeguard the employers' interests.

Before the adoption of the physical examination program there had been written into the Wisconsin law provisions intended to discourage oppressive plans of physical examination and rejection of employees or applicants for employment. It was provided that the advantage of experience rating and consequent lower rate of premium for compensation insurance is to be forfeited by the employer who applies an oppressive plan

of examination. Self insurers are deterred from operating such plans by a provision granting the industrial commission power to revoke the exemption from insurance of the employer who institutes them. Insurance carriers under similar provisions may have their licenses revoked if they "encourage, persuade or attempt to influence any employer arbitrarily or unreasonably to refuse employment to or to discharge employees." A further provision is for benefits to one discharged from work because of nondisabling silicosis, unless it has been found by the commission that it is inadvisable for the employee to continue in employment.

To answer the objections of labor organizations and of employers, reasonable standards and safeguards must be formulated under which examinations are to be conducted. Their scope and their use must be clearly defined. An agency must be stipulated for purposes of arbitration in event claim is made of misuse of the examination privilege. For years Wisconsin has considered this subject. Two years ago the commission called a conference including representatives of labor organizations, employers, physicians and insurance companies to consider the possibility of setting up a program of physical examination of employees in this state. Committees were appointed to consider the various phases involved. One of these committees was a medical committee, the representatives of which were chosen by labor, by industry and by the industrial commission. A dozen meetings were held at which prolonged consideration and study was given to the subject. As a result of these deliberations the main committee presented a report, after which the industrial commission adopted the Wisconsin physical examination programs. The plan is in no way compulsory. The fact that it has been generally approved by representatives of interested parties leads the commission to believe that it will be widely adopted.

Under the plan all physical examinations are to be made by physicians selected by the employer. If there is a grievance on the part of the examined employee, the industrial commission on proper complaint will cause investigation to be made, and if the grievance is found to be justified the employer is to cause further examination of such employee to be made by another physician. The report urges that any practice inconsistent with the plan be presented to and acted on by the industrial commission. For such purpose the commission may appoint an advisory committee to be composed of representatives of labor, of industry and of the medical profession. Examinations are to be paid for in full by the employer, including lost time or transportation expense occasioned by examinations to employees in service. Preemployment examinations should be made prior to employment if possible. It is recognized, however, that there may be uncertainty as to qualifications other than physical fitness, so a test period is provided to enable the employer to learn of the employee's qualifications and to delay preemployment examination in such cases for a period not in excess of thirty days.

The medical subcommittee concluded that a program of this type should cover all types of industries. Protection of health and improvement in the physical well-being of the workers was first in their minds. Improvement in the economic status of workers as the result of protection of health is reflected in the reduction of time and wage loss resulting from ill health, and any program that tends to improve and protect the health of industrial workers tends to reduce the incidence of occupational accidents and diseases. With these principles in mind the committee adopted a report covering scope of examinations, reexaminations and specified procedures for different types of employment. In addition to physical examination, laboratory procedures are to include a chest roentgenogram (flat plate), blood serologic study for the diagnosis of syphilis, urinalysis for sugar and albumin determinations only, and blood examination.

One of the occupational diseases which today calls for large payment of benefits in Wisconsin is that of dermatitis caused by contact of individuals with substances used in their work. The program is not to be static. It is elastic and calls for continued study of specialized processes and of education of

physicians to the awareness of the changing hazards brought on by progress in industrial operations. To insure success there must be the closest cooperation on the part of medical men and their organizations with labor and industry and unceasing vigilance by all in the discovery of newer and better practices as available. The subcommittee recommended that the original examination form be retained by the examining physician for his own record and that no other similar form be issued to either employee or employer. However, the employer and the employee should be informed of any defects which are found. So the report which is given to the employer and employee contains a notation as to physical defects (other than lungs), visual defects and, when pertinent, a further notation as to lung examination, with suggestions and recommendations.

Always it is to be stressed that the employee is to be considered a personal patient and treated as such by the examining physician. The relationship between these parties is that which should always exist between physician and patient. The employee's family physician is entitled to the full report of the examination so that he may intelligently treat his patient. When defects of a private nature are discovered, treatment is to be insisted on, and state and local laws covering treatment are invoked if the employee refuses to accept proper treatment.

The committee concluded that because of statutory provisions it was beyond its jurisdiction to prevent the admission of any examining physician's report as evidence in a compensation case. The use of the report in compensation cases will result in an honest factual determination, and the question of a pre-existing condition or of aggravation will be given careful consideration by the commission. Use of the report will in no way prejudice the applicant, provided his claim is legitimate, and will in many cases assist him in establishing his claim by dispelling doubt as to a previous condition.

The program adopted is open to modification as often as required. It is an innovation of a pioneering nature. With the modifications which experience may suggest, we believe it will result in increased prevention of accidents and disease, in a happier placement of employees in work, and in the greater social and economic good of employer, employee and the state.

Scope and Methods of Industrial Physical Examinations of the Wisconsin Plan

DR. PAUL A. BREHM, Madison, Wis.: To promote an industrial health program, a medical subcommittee was appointed to consider a schedule of preemployment physical examinations and subsequent periodic reexaminations for workers in Wisconsin industries. I shall consider only the deliberations of the medical committee on the five points covered in the recommendations.

1. *Scope of Examinations to Be Made, Including Preemployment and Subsequent Examinations and Periodic Reexaminations.*—Much of the discussion during the committee meetings involved extending the scope of the examinations to include all industries, and also the inclusion of a chest roentgenogram as a routine diagnostic measure. It was felt that this is essential in making a diagnosis of tuberculosis, and from the standpoint of reducing the incidence of this disease the procedure was recommended. A routine x-ray study of the chest was considered important for the control of tuberculosis in any occupational environment. A flat plate was considered sufficient for routine examinations, whereas stereoroentgenograms may be necessary only in questionable cases of active tuberculosis or for the purpose of consultation. The importance of routine serologic examination of the blood for the diagnosis of syphilis is advocated for the protection of the infected individuals and prevention of spread of the disease. Syphilis in an infectious stage indicates adequate treatment before the infected person can engage in any occupation. Syphilis in a noninfectious stage should not exclude the patient from employment but should call for medical control. In industries preventing excessive hazards or hazards the nature of which requires frequent special laboratory investigation, it will be necessary to reexamine the individual, the interval of time depending largely

on the judgment of the examining physician; where only specialized procedures are frequently employed, the general physical examination need not be made except at the two year intervals. Specialized procedures for different types of employment to determine ill effects of exposures on workmen will necessitate supplementary information to be used by the examining physicians. It is advisable that a manual be prepared containing special diagnostic measures and physical examination guides for the various specific industrial hazards. The medical committee was of the opinion that of the greater importance in a new venture of this kind was to advocate a general program of physical examinations in all types of industries, thus laying the foundation on which to build soundly in the future.

2. *Form of Reports to Be Made by Physicians.*—Sample form A, advocated for reemployment and periodic reexaminations, includes personal history, occupational history, past medical history, spaces for recording the results of a complete physical examination and the required laboratory measures, space for special examination procedures, name of the physician making the x-ray study, name of the family physician, name of the examining physician and corresponding sections for four examinations. Sample form B is included for reporting the results of the examination in duplicate to both employer and employee.

3. *Whether or Not the Report Should Be Supplied in Its Original Form to Employer and Employee.*—The clinical judgment of the examining physician will determine the extent of information furnished to employer and employee. To report minor or unimportant data may create misunderstanding or fear. Only those significant defects which directly affect the employability of the applicant or which, if corrected, would benefit his physical well-being, are of major importance in an examination report.

4. *Reports in Compensation Cases Covering Injuries Claimed to Have Arisen After the Time of Examination.*—Because of statutory provisions it is beyond the jurisdiction of the medical committee to prevent the admission as evidence in a compensation case of any examining physician's report. Attention again is called to the fact that the examining physician's report of the physical observations is made in duplicate, the original to the employer and a copy to the employee. This routine may preclude the possibilities of either too widespread use of reports in compensation cases or having the reports fall into unscrupulous hands.

5. *What Conditions Shall Influence Employment.*—The committee felt that diseases, deformities and disabilities are too variable in degree and extent to permit of a practicable schedule. In such matters the clinical judgment of the examining physician must control, for with him rests the decision of evaluating physical fitness of an individual. To include a long list of diseases and disabilities in the medical committee report might serve to defeat the program. The physician will find those applicants who are physically fit for any occupation, those who are fit for any job but have some minor and correctable defects, those who because of defects must be limited as to occupation and need medical supervision but not necessarily medical attention, and finally those who because of disabilities will be unable to work and who will require medical attention. Examples of the latter group are persons disqualified for work because of (1) active tuberculosis, (2) syphilis in the infectious stages until proof of adequate treatment is submitted, (3) communicable or contagious diseases of any kind until recovery is complete, (4) hypertension only when associated with damaged heart or kidney function or both, and (5) serious defects of vision or hearing in hazardous employment where the safety of others depends on the physical fitness of such afflicted persons.

The schedule of physical examinations proposed by the medical subcommittee is a voluntary plan, and industry has a choice of adopting the program in whole or in part or of rejecting it entirely. The committee attempted to formulate a practical plan of physical examinations to apply to workers in all industries. For the benefit of physicians who will make the exam-

inations and pass judgment on the physical fitness of the applicants, it is essential that they familiarize themselves with all the environmental factors within the plants they supervise. The program is a beginning in the direction of rendering a necessary service to industry and labor. The medical committee hopes that it will be a real factor in the improvement of the health and safety of industrial workers.

DISCUSSION ON PHYSICAL EXAMINATIONS

DR. NATHAN DAVIS, Chicago: I agree with Dr. Woody that it is important to make these examinations personal in character and stress the individual employee. The examiner should be a consultant, who stands between the personnel department and the employee in determining his fitness for certain work and should also work closely with the family physicians and see if there are correctable defects or defects that need observation. Of course, any disease condition or mental worry has a bearing on the efficiency of the employee and may contribute to the failure of the human element. If the plant examiner will take a personal interest in the employees, nervous reactions will be minimized. I feel, as Dr. Hussey said, that the preemployment and periodic examination of all employees should be stressed, and I think that the employer and the office force should be included. The family doctor's lack of knowledge of the working conditions often makes it inadvisable for him to be the plant examiner. The fact that he has a personal interest in the care of the patient is not so important as his ignorance of conditions of employment. I agree with Dr. Hussey that in medical school and afterward, through the efforts of the medical societies, instruction and preparation for the work of a plant physician should be given to men in active practice because many industries have so few employees that they cannot afford to obtain the services of a specialist in that field. Cooperation with the health department is important. The statement that in medical education too much attention is paid to disease and not enough to health is worth stressing not only in industrial medicine but in all medical practice. I agree that x-ray films of the chest should be made in all cases. The cost is rather high, but the development of some of the newer methods for using small film will remove the economic objection to a large extent. The Wisconsin program, so far as it is a voluntary plan being urged on all industry in the community, is of great value. It stresses the importance of the failure of the human factor in the causation of accidents, and general inefficiency in industrial work. One type of examination was not particularly mentioned, and that is a reexamination of men, particularly of those in the older age groups who have been laid off for a time; such periods of inactivity may greatly impair efficiency, particularly of the older men. The examination of the man who has had a layoff is of tremendous importance in preventing difficulties thereafter and in eliminating claims. These examinations, to be universal, must be relatively simple, from the point of view of expense and the time required in making them. An employer in discussing this matter said that it was tremendously valuable if the management group would submit to examinations of the same type that were required of employees, before the employees were examined. When the employees saw that the employers felt these examinations were of value to themselves, it lessened some objection. The other objection on the part of labor will be removed if all men are treated alike, that is, if all with certain defects get the same treatment provided they have been working at the same jobs. They object also to being reclassified, but it is necessary for their own sake if not for the sake of the other employees. In communities where there are industries in which there is a dust hazard, the examination of not only employees but all citizens of the community is important to eliminate tuberculosis from the plant and from the community. The examination of record may well be made available to the family doctor, although reports such as Dr. Brehm describes would be sufficient for the patient and the employer; that is important, as it might gain more cooperation from the family doctor and would give the information for his record which he might not have if the patient remained well.

DR. A. G. KAMMER, East Chicago, Ind.: I noted that the Wisconsin plan recommended a reexamination at two year intervals. I wonder if that is an arbitrary position or whether there is experience behind the decision. I should be glad to know exactly the most practicable intervals for making reexaminations. It would be of interest to know how long an interval passed between the first examinations of the 1,000 men reported by Dr. Woody. The incidence of positive results and the percentages reported at a short interval, for instance, would indicate that reexaminations at short intervals are in order. If, on the other hand, the interval was a long one, it wouldn't mean so much. All interested in this type of work spend time occasionally in arriving at the score, such as Dr. Woody did for us this morning. I think that as time goes on and we more or less begin to report percentages of data we are going to find wide disagreements. His figure of 6 per cent of diagnosed respiratory diseases impresses me as being low. His observation of 12 per cent of men afflicted with disease of the cardiovascular system strikes me as being low. The thing we need to know here is the age of the men and the length of time it took the condition to develop. It doesn't do much good to argue about whether one failure is right, or another, until we start using the same diagnostic procedures and then decide on terminology. I think one of the functions of this group should be to draw up a more or less precise form of language to be used when we get together and talk about our work and compare results. The remark was included in Dr. Woody's paper, in connection with industrial health examinations, that good enough is best. Probably that is a rather practical way of viewing it. On the other hand, the worker in the plant where examinations are regularly made begins to rely on what is told him at the end of each examination, which may come up at the end of every year or every two years, and if you miss some diagnosis the man is probably going to go along and ignore warning symptoms too long. There, again, what is the right thing to do and how far to go are matters which probably have to be settled individually. I was pleased by the extent of the examination recommended by the Wisconsin group. I am wondering why sedimentation rates were not included as routine laboratory procedure. In some 14,000 examinations made in our plant, I think the diagnosis of leukemia has been made once, and the diagnosis of pernicious anemia twice, so I wonder at the practicality of doing a blood smear when looking for conditions of that type. The sedimentation rate, on the other hand, has proved enormously useful in helping us decide who is healthy and who isn't. True, it doesn't establish diagnosis, but it does tell us when our examining doctors have gone to sleep.

DR. J. W. DUGGER, Jackson, Miss.: Our examinations in Mississippi begin at home. Dr. Underwood, executive officer of the State Board of Health of Mississippi, says we must practice what we preach. We are required to turn in to him a record of the physical examinations of all the employees of the state board of health. This includes x-ray study of the chest, blood reaction and many other important points. We start in our own organization, and when I go into plants to sell my program the first thing I tell the employer and the employees is "We are not asking you to do any more than we have to do ourselves." The employer is seen and the program outlined to him. If I can sell my program to the employer, it is up to me to sell it to the employees. The employer will close down his machines when it is convenient and allow me to explain to the employees the benefits to be derived from these examinations. I explain the significance of the tuberculin test. Then I ask them if they would like to have this service and, in every instance, almost every hand will come up. I might add that the health officer in that county is seen, and if there is an industrial physician for that plant of course he is consulted and asked to cooperate. The procedure of our examination includes the personal history, name, address and vocation of the man or woman. What they do in the factory is recorded. Disease experience is also recorded. Each is asked if he has had typhoid immunization in the last three years or smallpox vaccination in the last five years. We examine the ears with

the otoscope and observe the nose and throat, as well as looking for gross defects of the teeth and noting whether pyorrhea, decayed teeth, or cavities are present, which are reported. We also examine the heart and take the blood pressure.

DR. WILLIAM J. SHERIDAN, Chattanooga, Tenn.: I come from an industrial city in the mid-South representing quite a few industrial plants, more from the workmen's compensation angle than anything else. A number of these industries have preemployment and periodic health examination. One reason I came to this meeting was to see if I couldn't get a better concept as to who is to be employed and who is not to be employed when the men come before me for physical examination. The problem of syphilis is about the only question that has been answered in my mind. I should like to have in the rest of the discussion something more concrete. I can sympathize with labor and with Mr. Zimmer that the average employee coming up for examination feels he may be turned down, and I think the doctor is taking a great responsibility on his shoulders when he refuses to employ some man who has a wife and dependents. True, that man represents quite an investment for the employer, but he certainly does represent an investment for his family. In further discussion I hope this will be touched on. I want to know what to do with the man 45 years of age who comes up for employment. Is he to be refused employment? I want to know what to do with the fellow with extensive fibrosis of the chest who doesn't have any symptoms. What am I going to do with the man with high blood pressure? What about the one who is overweight or underweight? How about the fellow who isn't in good physical condition and yet you can't put your finger on anything?

DR. J. J. BRANDABUR, Huntington, W. Va.: My remarks are the result of several years of study of the periodic physical examinations in the industry which I represent. There are some medical men who feel that the periodic examination should be voluntary and that it should be made by the family physician. I disagree first because the periodic physical examination was broached as a principle of the American Medical Association twenty-five years ago to the general practitioner, and he has been able to do little about it, so it was up to industry to lead the way. Secondly, people do not want any examination as long as they feel well, and usually by the time they begin to have aches and pains considerable damage has been done. What is more, requiring the family physician to pass on the physical fitness of the employee places too much of a burden on his shoulders. He is not conversant with the hazards of this man's job, as is the industrial physician. In numerous instances we have referred these men back to the family physician for treatment, and we receive a letter stating that the man's general condition is good for his age, but nothing is said about his ability to carry on his work, particularly if it is hazardous. The record of the periodic physical examination should be a matter of strict confidence between the employee and the medical department, and in no instance should a supervisory officer know the defects which are found unless the employee, as protection to himself, wishes them to be known. After all, the supervisory officer is interested in whether that man is able to perform his work efficiently, and even if he knew what the defects were he could not correct them. What is more, the records of these examinations should be kept under the supervision of the medical director and no one should have access to them. There are some who do not agree with me, but if you will discuss the matter with the progressive leaders of labor you will find that one of the greatest objections to either the preemployment or the periodic physical examination rests mainly on this question of secrecy. Labor leaders claim that too often, if the supervisory officer finds out about this or that employee's defects, the employer uses that knowledge as a wedge to get rid of the man. We have conducted the periodic physical examinations in our industry for several years with a great measure of success, and the management feels that one of the main reasons for this success has been that the reports of these examinations are a matter of strict confidence between the employee and the medical department. The reports

are kept under my close supervision. No one is permitted to see the report of any employee without authorization from the employee himself.

DR. CHRISTOPHER LEGGO, Crockett, Calif.: There has been little labor turnover since 1929; many companies are anxious to keep their workers until they are of retirement age, usually 65, and so the average age of the employee has increased. With increasing age, infirmities develop which make him unable to do the hard work to which he was adjusted to begin with. Then we assign him to a soft job. Those soft jobs have become saturated. We must in fairness to ourselves make labor understand that to protect those who have seniority with us we shall have to raise our standard of physical examinations somewhat, because each time we take in a new employee who becomes a problem early and of whom we have to take special care, we don't lay him off. We are beginning to have to do that at the expense of somebody older in seniority. It is a good deal a case of promotion by demerit, because the softer jobs are easier. The night shift jobs are usually day jobs carrying less physical work and probably a little more responsibility, so they are preferred. If we do not maintain a reasonably adequate standard of physical health, we are doing an injustice to the older employees.

DR. STANLEY J. SEEGER, Milwaukee: In order to put credit where credit is due, I wish to say that the so-called Wisconsin plan presented to you today is the plan of the Wisconsin State Industrial Commission. It was conceived by that commission and was brought to its present state of perfection by the commission. The commission deserves credit for its broad vision of social problems and of medical problems in the development of this plan. I should like to disclaim any credit at this time for the development of this excellent plan. In the second place, to make clear the matters with which the council has concerned itself I would say that probably 85 per cent of the industrial population of this country is cared for by the general practitioner, who has a relatively casual or, in some instances, a rather specialized interest in the problems of industry. That figure of 85 per cent may be high, but it can be vouched for in some studies, at any rate. We are not so immediately concerned with the level of physical examination in some of the ideally organized, large industries. We all know that problems exist there which are being studied by men spending their full time on work in these industries and who are giving these problems serious attention. In response to one of the discussers, it is the attitude of the council that we do not criticize the work of the leaders in this field. We do not fear for the future of the private practice of medicine because of the activities of men who represent the best in this field, and I think you will find we are on record to that effect. The problem which is arising and which is defining itself very rapidly is How are we going to extend the benefits of physical examination to the small industry which is now being cared for by the general practicing physician? We have brought this problem before you and have suggested means of organization within county and state medical organizations, so that the practicing physician may meet these problems. He must make certain concessions regarding the special nature of x-ray examinations, for instance, and must work out certain economic difficulties. I believe it can be done. I am not one who laments the fact that the general practitioner is not going to be competent to do physical examinations in industry or that his instrumentalities of organization are not competent to meet the problem of public health which is being put before him. I think the practicing physician must be made aware of what is going on in the minds of public health workers and of industrial physicians and surgeons in this regard. On the other hand, there is great need for public health workers to understand what is going on in medical organizations and to utilize the instrumentalities of county medical societies in the furtherance of their work. If this is public health work, I think we must all accept the principle, which has been stated so often by public health workers, that no public health enterprise can be carried to its logical conclusion without the aid of the practicing physician.

JANUARY 16—AFTERNOON

DR. C. W. ROBERTS, Atlanta, Ga., in the Chair

DISABILITY EVALUATION

Hearing Loss: Estimation of Disability

DR. AUSTIN HAYDEN, Chicago: Hearing has been enormously extended in the past sixty-five years since Alexander Graham Bell invented the telephone. With about 40 million telephones and 100 million radio receiving sets, the human voice can be heard all over the earth. In addition, electric recording preserves sound, so that our voices can be transcribed for reproduction to future generations. In spite of all that, the Illinois Industrial Commission did not until 1929 take any note of compensation for industrial hearing loss. For the total and permanent loss of the hearing of one ear in 1929, 50 per cent of the average weekly wage during fifty weeks and for the total and permanent loss of hearing in both ears 50 per cent of the average weekly wage during 125 weeks was set up. While the compensation for industrial hearing loss, as decided by the Illinois Industrial Commission, is infrequent and small, in civil suits the amounts are sometimes considerable.

I believe that proper standards for compensation and the accurate determination of disability following hearing loss had better be set up by organizations of this kind rather than haphazardly by socially inclined partisan groups. Employees, employer and the public are entitled, I believe, to the real facts about hearing and hearing disability. To ascertain these, hearing must be a definite part of a general physical examination at the beginning of employment, similar to vision. It must be part of subsequent examinations. Hearing must be a definite part of examination after injuries, especially on the head, and hearing expectation in certain employment must be carefully computed. In addition, the fact that hearing deteriorates with age, just as vision does, must be taken into account, and the word "presbycusis" instead of "presbyopia" is probably applicable. Older methods of hearing examination by voice, tuning forks, watches and so forth are no longer adequate. Audiograms are required. Individual tests of each ear separately are essential. They should be qualitative for sound frequency and quantitative (in decibels) for sound intensity, with a continuous frequency fundamental tone audiometer, calibrated at octaves as well as octave letters. They should be performed by or under the immediate supervision of an otologist, throughout the hearing range from auditory to pain thresholds, by both bone and air conduction, in a quiet testing room. Audiograms can be made rapidly, except for the very hard of hearing, and should include otologic history and complete ear examinations with investigation of vertigo when indicated. They are essential for the prescription of modern hearing aids, as well as for the determination of the unpredictable factors that are so common to hearing loss.

This slide shows an audiogram. The Council on Physical Therapy of the American Medical Association, through its Committee on Hearing Aids and Audiometers, is trying to get a standard audiogram to present to industrial men that will be readable and understandable throughout the entire country. We invite you to use that audiogram just as soon as it is ready.

Audiograms should be made on letter size paper for ease of filing. Audiograms may be filed as this slide shows, using a line for the whole chart and the dates at the side to study the progress of the otologic patient.

This slide shows the audiometer itself. Hearing is measured through the most useful part of the hearing scale, that is, from 128 to 8,192 cycles per second. That doesn't mean the entire range of human hearing, which would go from 20 to 20,000 cycles. The audiometer should be used in a quiet room, in a sound-proof room if possible. A room that registered 20 and not more than 30 decibels of sound would be advisable, and many offices can be made into such rooms at a small expense.

This slide shows an instrument that corresponds to the trial frame in ophthalmology. From the measurements that are made with the audiometer, the hearing curve is charted on the audiogram, and the defects in that hearing curve, the up and down steps or the even slopes of hearing loss can be fitted by

this audioscope. By its use the actual variations in sound amplification that the audiogram indicates should go into the patient's hearing aid and can be actually tried by the patient, just as glasses are tried in the trial frame for the correction of visual defects.

In every audiogram there are four lines, two for air conduction, which are generally indicated by unbroken lines, and two for bone conduction, which can be indicated by broken lines.

The individual shown in this slide is quite hard of hearing. He would hear by air conduction probably at 4 or 5 feet, but his bone conduction, which is an index of the condition of his auditory nerve, is way up at the top. He can be fitted splendidly with a bone conduction hearing aid, and his hearing can be brought clear up to the top, can be improved from about 20 feet up to about 4 feet by air conduction.

This slide represents a so-called middle ear or obstructive lesion. There are still four lines there. The bone conduction has come down, the air conduction isn't so bad, but all the lines are closer together, and that represents a mixed perceptual chart that is difficult to fit. You can't tell by looking at the chart definitely whether bone or air should be used, and it is not as favorable as the first one.

Now we have done something about seeing how much correction is necessary. We can tell by using the whisper test how much improvement a hearing aid gives. We can also place the receiver of the audiometer on the transmitter of the hearing aid and make an audiogram of the hearing aid. It is in these cases that the operation of hearing windows, so widely publicized within the last year, has been advised. In no case of which I have seen a record does the improvement after that six hour operation equal the improvement with a properly fitted hearing aid; and whatever the improvement is, the length of time that has elapsed since operation is not sufficient to assure that the improvement will be permanent.

An air conduction loss of 30 or 40 decibels would give hearing of 4 to 6 feet and would be improvable up to 12 to 16 feet by an air conduction receiver.

With the bone conduction, the results are startling. With a loss of 10 decibels by bone conduction, which might be 60 or 70 with air conduction, which might be a hearing distance of only 3 or 4 feet, you can get 20 to 30 feet, and so on down.

The decibel is something that does not submit itself to percentage calculation. For instance, one's heart beat is estimated to be 10 decibels loud. The threshold of pain is said to be 130. It is estimated that way on the audiogram I showed, but 130 doesn't mean 10 times 13 at all. It means 10 trillion times 10, so that the amount of the energy of 10 decibels going in here is increased beyond any calculation in percentage.

This slide shows the multiple parts that are available for hearing aids today. When you see that this transmitter can be combined with this receiver, this amplifier with this ear tip, this battery with any of those, you can readily understand that many hundreds of hearing aids, each one different from the other, can be made. What is the use of so many? It is just like cylinders and spheres in glasses. The irregularities of hearing loss call for amplification at many certain spots in the audiogram and that is accomplished by the use of these variously pitched parts together with the use of filament.

The Committee of Consultants on Audiometers and Hearing Aids of the American Medical Association, Council on Physical Therapy, is standardizing equipment and methods, so that clinical data can be universally interpreted and evaluations of function and loss of function accepted, as has been so well done in ophthalmology. Courts and compensation boards are demanding the same of otolaryngology.

The first audiometer for general clinical use met Council requirements less than three months ago. With the incomparable resources for clinical investigation that American industry provides in its splendid corps of physicians and surgeons, speaking through their Council on Industrial Health of the American Medical Association, cooperation between these two councils will greatly facilitate, for the benefit of all concerned, the accurate estimation in hearing loss quickly, accurately and justly.

Present Status of Estimating Disability from Visual Loss

DR. HARRY S. GRADLE, Chicago: Central visual acuity has been measured by means of the Snellen chart for a century or more, and the results of the Snellen chart are expressed in the form of what appears to be an ordinary fraction. Snellen never intended that to be a fraction; he intended that to be merely an expression in which the numerator was the distance at which the chart should be read and the denominator was the distance at which the chart actually was read. In other words, a vision of 20/20 means that the standard size chart, which should be read at 20 feet, was read at 20, whereas 20/40 means that at 20 feet the individual could only read that chart which should have been read at 40. The expression 20/40 does not mean a loss of 50 per cent of visual acuity. The thing you are to understand is that this was an expression and not a ratio, not a fraction, that led to the confusion. So the committee that was appointed by the Section on Ophthalmology of the American Medical Association in 1919 had to start practically from the ground up.

In the past, estimations had been made on the loss of visual acuity in the injured eye only, based on a percentage of the loss of the total eye. In other words, where one state allows fifty weeks' salary for loss of a total eye, the estimations had been that, if there was 20/40 vision, 50 per cent of that had been lost.

We started on an entirely different basis. We worked out a table which has been widely accepted by the compensation boards of the various states and by many large insurance companies. I thought, for your benefit, we might take this table to pieces today and analyze it and simplify the explanation. The committee started out by estimating how much the efficiency of the individual was decreased by the resultant loss of visual efficiency. We took as the base line from which to work complete total disability of the individual and said that complete loss of visual efficiency is equivalent to the total permanent disability of both eyes and is identical with total permanent disability of the individual. Then it simply is a matter of determining the visual efficiency, and we for the first time took into consideration the efficiency not only of the injured eye but of the uninjured eye as well.

The efficiency of any eye is a question of several factors. The first factor is, of course, the central visual efficiency for distance. The central visual efficiency for distance is measured by the Snellen chart, that is, the ability to recognize letters at an angle of 5 minutes. That is known as 20/20. We accepted the Snellen standard of measurement of central visual acuity at 20 feet under illumination of not less than 3 or more than 10 foot candles. For normal, or 100, 20/20 has been universally accepted by ophthalmologists from time immemorial.

What was the zero line? Total blindness is absolute zero, and it was impossible to estimate the exact evaluation of total blindness. After experimental work, we found that 20/800 represented the maximum loss that could be measured. In other words, if a man could see at 20 feet only such characters as he should be able to recognize at 800 feet, he was practically blind. Therefore we accepted 20/800 as a 99.9 per cent loss in central visual acuity.

The next factor that had to be considered was the visual acuity for near. In the past, they have taken into consideration only vision for distance. That is all right for a man who is working as a common day laborer, but a man who is doing fine work, near, may have comparatively useful distant vision but his near vision would be hopelessly destroyed so that his efficiency would be lost. That necessitated, on the part of the committee, a complete evaluation of vision for near, and we accepted the standard reading distance of 14 inches and on that basis worked out a similar table, where central visual acuity for near is also taken into consideration and measured. We must take into account also the visual field of that eye. The average ophthalmologist does not have the graduated chart for near. Therefore it became necessary to develop this chart, which was published in a later issue of THE JOURNAL.

We have here the Snellen notations at 14 inches based on the American Medical Association table and, correspondingly,

in the diopter or metric system, or on the Jaeger No. 1 system, the size of the letters, the visual angle, and the percentage of visual loss. That figures out exactly as does the visual acuity for distance.

The next factor which must be considered for visual efficiency for one eye is the visual field. There are many disabling effects that cause a decrease in the visual field, so we accepted the standard field, as shown in the perimeter, in which the field is plotted in the eight principal meridians. In measuring visual efficiency of each eye, the visual field must be taken in the eight principal meridians. The amount of field that persists in each meridian is then added together and divided by 420, which gives the total visual field efficiency of that eye in percentage.

So the extent of the field of vision shall be determined by the use of the usual perimetric test methods, a white target being employed which subtends a 1 degree angle under illumination of not less than 3 foot candles, and the result plotted on the industrial visual field chart.

The amount of radial contraction in the eight principal meridians shall be determined. The sum of these eight, divided by 420 (the sum of the eight principal radii of the industrial visual field) will give the visual field efficiency of one eye in percentage.

There is one more factor that must be taken into consideration in determining the visual efficiency, namely the motor ability of that eye. If one eye is disabled so that it cannot move simultaneously with the other, there will result double vision. Therefore it is necessary first to measure and then to plot out the motor function of each eye. When diplopia is present, this shall be plotted on the industrial motor field chart. This chart consists of twenty rectangles, representing the motor field area of the two eyes in question. If diplopia is present, we must test for it at 1 meter with a red light and a candle in each one of these twenty areas, and from the results there is evaluated a definite loss in motor function according to the number of areas in the rectangle in which diplopia exists. In other words, if there is no diplopia there is 100 per cent motor function, whereas if diplopia exists in all twenty fields there is complete loss of motor function.

Now we have the factors that are concerned in the development of industrial visual efficiency of the eye. How shall we evaluate? They are not all of equal value. First, we work out the central visual acuity efficiency. In doing so we take the visual acuity for distance and give to the visual acuity for near a twofold value. In other words, near vision is practically twice as valuable to the industrial laborer as is distant vision. In order thus to attain the central visual acuity efficiency, we take the value of the central visual acuity for distance, to which is added twice the value of the central visual acuity for near, all divided by three. This gives us the central visual acuity efficiency of the eye, taking into consideration the vision for distance and the vision for near, and laying weighted value on them.

For the visual efficiency of the eye we have to multiply the central visual acuity efficiency by the visual field efficiency, the muscle function efficiency. In other words, the central vision, which is composed of distant vision and near vision, times the efficiency of the eye as regards the visual field, times the motor efficiency of the eye, gives us the visual efficiency of the eye in question. That is done to both eyes, but here too there is a weighted value to be given. Perhaps it can be put down in this form. The first calculation is the central visual acuity for distance plus two times the central visual acuity for near, which gives the visual acuity efficiency of one eye. Then the visual acuity efficiency times the muscle function, times the visual field efficiency, gives the result of the visual efficiency of one eye. The injured eye may be the better eye of the two. Consequently we do not speak of the injured eye or the uninjured eye but we speak of the more efficient eye and the less efficient eye.

To obtain the visual efficiency of the individual we take the visual efficiency of the less efficient eye, no matter whether it is the injured or the uninjured eye, and add to that three times the visual efficiency of the more efficient eye, and that divided by four gives the visual efficiency of the individual. If we

have visual efficiency of the individual in terms of percentage, subtracting that from 100 per cent gives us the amount of loss of efficiency of the individual, basing that on the complete disability of the person as a whole. All through the pamphlet are given various illustrations to show how it works out.

On page 10 is the authorization. This report, as published by the Committee on Compensation and adopted by the Section on Ophthalmology, was adopted by the House of Delegates in 1925. It then became the official report of the American Medical Association on the estimation of appraisal of loss of visual efficiency subsequent to injury.

Let me call attention to paragraph 2, page 4, probably the most troublesome aspect. If a man has a traumatic cataract, that cataract is either absorbed or operated on, and there results with the proper correcting glass 100 per cent central visual acuity for distance and for near, to what is that man entitled? It is impossible for him to wear the glass over the affected eye and use that eye and the uninjured eye simultaneously because of the size and image of the two eyes. Is he entitled to compensation for the loss of an eye because he cannot use the two eyes simultaneously? On the other hand, if the other eye was injured he still would have the perfect eye to fall back on. Therefore the committee decided that, if there is a greater difference than 4 diopters of spherical correction between the two eyes, the best vision that can be obtained with not more than 4 diopters difference in glasses shall be that which is used. It works out practically that if the uninjured eye is normal and the injured eye necessitates glasses for correction, the individual obtains about 75 per cent of the compensation that will be awarded for the complete loss of an eye. Probably that is the fairest plan that could be made.

There are certain types of ocular disturbances which are beyond possible estimation: disturbances of light and dark, various deformities of the lid resulting from scar tissue, muscle disturbances that are not included under diplopia, and things of that sort which have been worked out, each one on its own basis. There can be no mathematical appraisal of such losses. One should not be in too big a hurry to estimate a visual loss. We believe that at least four months should elapse from the time of injury before the examination is concluded on which the appraisal is to be based. We also recognize that in the course of time certain improvements will occur, but it is impossible to drag the time out too long. Therefore twelve months is the maximum time that should be allowed to elapse before the examination is made.

This is an extremely simple table, which merely requires a little understanding of the analysis. If you figure again the analysis that is based on each eye individually, realizing that the analysis of each eye is based merely on visual acuity for distance, visual acuity for near, visual field and motor function and put them into the formula in which the weighted values occur, you will have no difficulty in estimating the percentage of complete disability of the individual that may result from injury to one or to both eyes.

Presentation of Dr. Ludwig Teleky

Dr. Ludwig Teleky, lately of Vienna, was introduced by Dr. Robert T. Legge, of Berkeley, Calif.

DR. LUDWIG TELEKY, lately of Vienna: I am happy to be in this beautiful country, and not only that I can be here but that I can work here. It is very odd for me to work in a country which has so many scientists in my field and who have done so much good work. So I came here to learn and to see the work which has been done by your scientists.

Are Uniform Standards of Evaluation Practicable?

DR. EARL D. McBRIDE, Oklahoma City: The physician called on to assist in the cause of justice by rendering expert testimony is of value to the side of the case employing his services or else he is not called to testify. The testifying physician must conduct himself according to the rules of the court. He cannot elect to relate and explain his observations and opinions in his own manner. Questions are cleverly designed to elicit desirable answers. The clinical data are twisted to meet a given situation. Scientific deductions are discredited by sly inference. Facts are distorted to meet a theory of the case.

Hypothetical questions are propounded to fortify or impeach evidence. The scientific background of the medically trained mind does not conform well to the legal methods of arriving at conclusions of fact. Proof of reality in the development of scientific facts is accomplished through systematic research. Facts to be proved are based on a chain of reasoning directed by facts already established. The scientific minded physician dislikes decisions involving a monetary issue and recoils from any action which may trespass on the scientific spirit.

In view of this situation I should say that uniform standards of evaluating disability are practicable but certain adjustments will be necessary before they can be suitable for recognition by either the courts or the medical profession:

First, the judiciary must remedy the system which permits inconsistencies due to partiality in the scientific presentations of medical experts.

Second, the medical schools must improve the curriculum of medicolegal instruction to train the student how to meet judicial inquiries with the same degree of confidence expected of him in diagnosing disease or in consulting with others of his own profession.

Two adjustments which would be beneficial on the part of the judiciary are:

1. Doctors called as medical witnesses on opposite sides of the case should be permitted to consult and to compare and present their observations and diagnostic opinions with the same degree of serious, scientific intent as is expected of them in the practice of medicine.

2. Prestige of a specialist should be acknowledged by the court as rated by medical bodies and boards established for the purpose of standardization. The qualifications admitted only by the doctor as he takes the stand should not be relied on.

The medical profession could make the following adjustments:

1. Medical bodies governing actions of their individual constituents could adopt standard rules and regulations covering qualifying standards and professional behavior of the doctor in court.

2. Medical associations of national scope might prepare and adopt certain fundamental principles of medical standards in evaluation of personal injury and permanent disability.

When such adjustments are accomplished, standards for evaluating disability will be not only practicable but authoritative. There will be more confidence in the testimony of medical experts.

The problem of setting up such standards is a pressing issue. Arbitrary ratings and pension payments have been set up by law that seem to meet the need in a number of situations; however, it will never be possible through medical analysis to tabulate or grade equitable evaluations of permanent disability by dogmatic scale. As doctors we cannot tabulate percentages of disability common to all forms of physical alterations of the body and expect to establish an adequate schedule that will meet individual circumstances of working capacity. For years I have attempted to point out that the medical examiner should confine himself to his field of knowledge and experience when determining percentages of disability. This method of arriving at a conclusion should be as scientific as that of arriving at a diagnosis in human illness. The doctor is actually not competent to evaluate disability with respect to manual labor or specific vocations because he is not trained to know their technical requirements. He is competent, however, to determine the extent of loss of use of a part of a man's body as compared with the normal. Therefore, as a basis of procedure in evaluating permanent disability I have recommended that we rely on the determination of the extent of function of the body or parts of the body as they are affected by disability. Such a determination falls conclusively within the field of medical practice. Function, or the ability to perform useful activity, is one standard unit of measurement which can be used authoritatively by the medical expert in his disability appraisal and the court may then arbitrate loss of earning capacity and adjust monetary awards.

A practicable formula is established by integrating function into seven component factors, each of which is given a percentage value in its relation to 100 per cent. These factors and their relative percentages of value are designated as

follows: (1) quickness of action, 10 per cent; (2) coordination of movement, 20 per cent; (3) strength, 20 per cent; (4) security, 10 per cent; (5) endurance, 20 per cent; (6) safety as a workman, 10 per cent; (7) prestige of normal physique, 10 per cent. Much more could be said on this subject, which would require a volume to contain the technical details contributing to the successful use of the formula presented. Uniform standards of evaluation of disability are practical. The true medical status of disability is not under the prevailing system.

The Evaluation of Disability Following Industrial Accidents

DR. HENRY H. KESSLER, Newark, N. J.: The extent of bodily injury has been used in arriving at an evaluation of reduced earning ability. Theoretically this method is fundamentally incorrect, for it is not the lesion that is to be indemnified but the effects of that lesion on the earning capacity of the injured person. A similar lesion in different individuals may not have the same effect. Age, sex, occupation, social condition, economic stress and opportunity for employment may have an important bearing on the ultimate loss in earnings of an injured workman.

There is no system of pathology through which the capacity to work can be clearly determined. Nevertheless society has forced the physician to derive a social judgment from pathology. A man lame in two legs may be fully capable of work, while a neurotic person may be completely incapacitated. This produces an inconsistency and conflict that is frequently found between the pathology of defect and the economy of working capacity. While lead poisoning and spondylitis are medical illnesses, incapacity to work is a social illness.

It may be readily seen why there is so much discrepancy in the estimates made by several physicians in the same case. This is not the result of lack of honesty in the examining physicians as much as the lack of a common ground on which to meet. Moorhead, in rating permanent disability after fractures, suggested that three factors be taken into account: the anatomic result, the functional result and the cosmetic defect. McBride has suggested the use of seven psychophysical traits as arbitrary criteria for estimating disability. Since the range of human capacities is limitless it would be fallacious to select these traits to the exclusion of others. The method of ascribing fixed values to each factor and the method of determining each value is left to the opinion of the examiner. No attempt is made to measure actually the degree of impairment of the individual trait.

I have recommended the use of function as a criterion for the evaluation of permanent disability. I have defined function as it applies to the extremities, as motion of the joints, power of the muscles and coordination and control from the brain through the peripheral nerves. I have further described a detailed technic for the actual measurement of these qualitative components of physiologic function.

General tests of bodily function or efficiency have been used by many. The pulse rate and blood pressure are taken before and after exercise and compared with arbitrary normals; in addition, specific functional tests have been developed for the extremities and for vital organs. All these tests, however, are false; first, because they do not evaluate the total body but select and abstract only a small part of it; second, because of the mechanical fallacy.

Physicians, as well as laymen, frequently commit the error of undervaluing the individual's capacity to work. It is often assumed that a physical defect causes limitation of functional activity and hence limitation of industrial usefulness. This line of reasoning is frequently invalid. While it must be conceded that the disability may limit the number of opportunities open to the disabled person, it is far from correct to assume that a physical disability always means incapacity to work. Regardless of the yardstick used, the judgment is apt to be erroneous. This is due to the ever present psychic component and to the presence of the safety factor.

The case histories of 4,404 men with permanent orthopedic disabilities, covering a period of thirteen years, were exam-

ined by Anderson, and the actual jobs they had held for that period of time were listed. The data indicated that among 10,176 jobs held by these men there were 635 different types of work, representing 70 per cent of the 557 occupations and occupational groups listed in the United States census of 1930. These figures give striking evidence of the versatility of these handicapped men. How do these physically disabled persons manage to make their physiologic adjustments? How do they accommodate themselves to the unusual demands made by disease or by congenital or acquired defects? The answer will depend on the presence of human safety factors and personality adjustment.

A person can get along with one third of a kidney or one fourth of a liver, without a stomach, without a large intestine, with one tenth of the pancreas, with one third of the thyroid, with one fourth of the parathyroid, with one tenth of an adrenal, with one tenth of an ovary, with one half of the total volume of blood and with 20 per cent hemoglobin. There is also a factor of safety in the ability to substitute one food-stuff for another.

Personality maladjustment plays an even more important role in the causation of incapacity to work than the physical deformity. It may be so great as to suppress the individual completely.

We are faced with this practical problem of assisting the industrial commission in the rating of permanent disability. The problem can be solved in two ways: A method which I rely on is the use of an actual work demonstration on the part of the patient. This method was carried out through the use of a curative workshop consisting of a complete woodwork and paint shop and all the tools used in carpentry and cabinet making with the exception of automatic machinery. There is a weaving department with two looms, where rugs and other articles are woven, and a fairly complete print shop, with type cases, press and other equipment. Here the injured person or the convalescent is gradually adjusted back to employment conditions without overtaxing his physical resources. Here the man with lowered morale and lost confidence has an opportunity to establish himself under favorable and sympathetic auspices yet with a mild discipline that develops his morale. The work shop has been in operation fourteen years and it has demonstrated its value as a therapeutic agency by rehabilitating badly disabled persons in difficult cases and by serving as a laboratory for determining work capacity and employability.

On the basis of an actual demonstration of work the patients are arbitrarily divided into three groups: those who are non-productive, those who show a fair productiveness and those who are very productive. Arbitrary estimates of disability are allotted as follows: 60 to 100 per cent for the non-productive group, 33 to 50 per cent for those showing fair productiveness and 0 to 10 per cent for the very productive group. The second method is the adoption of schedules or principles of evaluations proposed by representative medical bodies. The work of the Section on Ophthalmology of the American Medical Association is an excellent example of such a contribution. The suggestions of the Council on Physical Therapy with respect to audiometer tests of hearing defects is a further illustration. In European compensation practice, schedules and methods of evaluation submitted by private physicians not associated with the official administrative agency are frequently given official approval and are utilized in making determination. The tables of Liniger and Molinex in Germany and those of Sachet, Imbert, Forgue and Jeanbrau are examples of this procedure.

DISCUSSION ON DISABILITY EVALUATION

DR. W. P. WHERRY, Omaha: I am here only as an observer, representing one of the larger special societies, but in that capacity I do appreciate the necessity for what Dr. Kessler called dictatorial standards. I admit that variables must always enter into a medical evaluation of a defect. It is the medical man who must estimate the variables. However, when compensation and disability are discussed in terms of dollars, there are other professions that ask assistance along mathematical lines, more or less, and medicine must adjust itself to setting up base lines, a common ground, whether it is a matter of hearing,

vision or functional defects of workable parts of the human body. From that basis we perhaps shall have more of an acceptance in court in compensation adjustments than if everything is left to the whims of a medical mind. One thing that has been said against medicine is that six expert witnesses in hearing defect cases will none of them agree. I think it is the expression of many lawyers that a medical witness is used for the effect on the jury rather than for the acceptable factual data. That is a travesty on medicine. One of the objectives of the specialty which I represent is not to put matters on the basis of an exact science, because when anything becomes an exact science it ceases to be a science; but I also feel that with a common base line medicine will have a better acceptance. Much of this economic pressure has been brought on medicine because of the high cost of poor medicine, not the high cost of good medicine, and I can't help but feel that in the evaluation of defect problems poor judgment can sometimes be put in the same category with poor medicine.

QUESTION: I should like to ask Dr. Hayden what type of intensity of noise he regards as damaging to workmen's ears, and the best type of protection to afford him against such damage.

DR. AUSTIN HAYDEN, Chicago: That depends on the constancy of the noise and on sudden or temporary increases of noise, as, for instance, in a plant where explosives are used to blow food out of reservoirs. We made some studies and found that the workers in a plant of that sort had a very considerable loss of hearing in the upper tone scale. Prevention means many things that many workers don't like to do. If they use plugs of cotton or wool or other material in the external auditory canal, the jar through the bones of the skull may be a factor even though the canal is closed. The changes begin, both in war and in such occupations as I have mentioned, in the upper tone scale. Not enough work has been done yet to determine whether that can be prevented or not. The same is true of boiler-makers' disease and may be true of caisson workers. A suggestion has been made that perhaps the best individual to put into a noisy occupation is one who is hereditarily disposed to chronic loss of hearing. That is to say, if he has a strong history of otosclerosis, maybe he is the fellow that ought to go into that work because his ears are going to get bad anyway. That has been proposed by the United States Public Health Service, and it has some merit.

DR. EARL D. MCBRIDE, Oklahoma City: The point I was making in my paper is that if we have a formula, something to go by after we have done all of our examination, after we have used our measuring apparatus and made our tests, as Dr. Kessler suggests, we can analyze the results according to that formula. I have tried it with several different individuals, when we had a claimant's attorney, a company attorney, a commissioner and myself, and we weren't 5 per cent apart when we asked ourselves the same questions through that same formula. If we can hit on something that will give us a uniform method of reasoning, then I feel we shall not be far wrong when we come into the industrial court with these disabilities.

DR. H. H. KESSLER, Newark, N. J.: I think Dr. McBride has emphasized the important point, the question of agreement on certain bases and formulas. There is one other point and that is the notion that so many differences exist between individuals. If you carefully scrutinize the studies that have been made with respect to the actual traits in human capacities in all individuals that have been carefully measured, you will find those differences not as great as you think them. It is remarkable, but you will find that rarely does the efficiency, the productivity or the dexterity of one individual exceed by more than twice that of the less efficient individual. I mention that because so much emphasis has been made on these minor physical defects. I think this emphasis is due not so much to a rational, scientific appreciation of their importance as to a peculiar emotional factor. This emotional factor is tabu. Actual studies of accident proneness in handicapped persons have revealed that the accident proneness of such an individual is somewhat less than that of the normal group.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 685 has passed the House, proposing to create a Bureau of Water Pollution Control in the United States Public Health Service. Before the bill was passed, the House accepted an amendment proposed by the House Committee on Rivers and Harbors striking from the bill the provisions proposing federal grants-in-aid to assist states, municipalities and public bodies to construct treatment works to prevent pollution of navigable waters and substituting therefor an authorization whereby the Reconstruction Finance Corporation may make loans to finance the construction of treatment works. S. 2284 has passed the Senate and House authorizing the President to appoint in the navy 100 acting assistant surgeons for temporary service.

Bills Introduced.—S. 3461, introduced by Senator Murray, Montana, and H. R. 8730, introduced by Representative Keller, Illinois, propose to provide for the general welfare by enabling the several states to make more adequate provisions for the control and prevention of industrial conditions hazardous to the health of employees. These bills contemplate that there shall be appropriated for the fiscal year ending June 30, 1941, the sum of \$1,000,000; for the fiscal year ending June 30, 1942, the sum of \$2,000,000; for the fiscal year ending June 30, 1943, the sum of \$3,000,000, and thereafter such sums as may be necessary to carry out the provisions of the act. Such amounts, it is proposed, will be allotted to such of the several states as have submitted plans acceptable to the Secretary of Labor. A plan may not be approved by the Secretary of Labor unless it provides for its administration by the state labor department or other agency charged with the administration of the general labor laws of the state or under their supervision; provides for compulsory reporting by employers to the state agency charged with the administration of the plan of all cases of disability or death due to any disease caused, accompanied or aggravated by exposure to conditions of employment hazardous to health; provides for an industrial hygiene agency to develop and appraise methods of controlling industrial conditions hazardous to the health of workers, and provides that the state agency or agencies administering the plan will make such reports, in such form and containing such information as the Secretary of Labor may from time to time require and comply with such provisions as the Secretary of Labor may from time to time find necessary to insure the correctness and verification of such reports. The Senate bill is pending in the Senate Committee on Education and Labor, the House bill in the House Committee on Labor. S. 3435, introduced by Senator Reynolds, North Carolina, proposes to provide for domiciliary care and medical and hospital treatment for former members of the military and naval services who are suffering with tuberculosis. H. R. 8672, introduced by Representative Lemke, North Dakota, proposes to prohibit the use, sale, purchase or exchange of any seal, stamp or certificate of another person, association, organization or company denoting or implying equality or superiority in purity, quality, usefulness or effectiveness of any drug, food, cosmetic, therapeutic lotion, therapeutic device or diagnostic or surgical assists in comparison or competition with other products of like kind, or similar nature, unless, such seal, stamp or certificate has been approved by the Federal Trade Commission. H. R. 8695, introduced by Representative Tolan, California, proposes to provide grants to the states for assistance in the rehabilitation of disabled persons incapacitated for normal employment. H. R. 8696, introduced by Representative Tolan, California, proposes federal grants to assist states to provide money payments to needy individuals who are 18 years or more of age and who are totally and permanently disabled and incapable of self support by reason of physical defect or impairment of the body, other than the mind. H. R. 8765, introduced by Representative Pearson, Tennessee, proposes to provide for free hospitalization and medical attention for all veterans of the World War and the Spanish-American War in government facilities. H. R. 8794, introduced by Representative Thill, Wisconsin, proposes to permit federal income tax payers to deduct amounts actually

paid during the taxable year for medical, dental, surgical or nursing treatment or hospitalization of the taxpayer or his spouse or any dependent for whom a credit is allowable. H. R. 8800, introduced by Representative Tolan, California, proposes to amend the Social Security Act so as to provide benefits for persons physically disabled to such a degree that they are not capable of self support.

DISTRICT OF COLUMBIA

Bills Introduced.—H. R. 8670, introduced, by request, by Representative Bolles, Wisconsin, proposes to establish a Board of Funeral Directors and Embalmers for the District of Columbia. H. R. 8692, introduced by Representative Randolph, West Virginia, proposes to enact a new podiatry act for the District of Columbia. Under the provisions of the bill any person is to be regarded as practicing podiatry who furnishes, or advertises to furnish, podiatry service or performs or causes to be performed podiatric operations of any kind, diagnoses, or professes to diagnose, prescribes for or treats or professes to treat disease, pain, deformity, deficiency, injury or physical condition of human feet or adjacent structures. Among the subjects on which applicants are to be examined are pathology, materia medica, surgery, and clinical and orthopedic podiatry.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—H. 532 proposes to appropriate \$150,000 for the establishment of a state tuberculosis sanatorium in Johnson County, to be under the control and supervision of the department of welfare. H. 539 proposes a procedure whereby hospitals may be reimbursed by the state for the expense of caring for indigent persons injured in motor vehicle accidents.

Bill Introduced.—H. 534, to amend the uniform narcotic drug act, proposes to define narcotic drugs so as to include cannabis.

Mississippi

Bill Introduced.—H. 552 proposes to authorize boards of supervisors of the several counties to levy, in addition to the levy for indigent sick, a special tax of not exceeding 1 mill on all the taxable property of the county, to provide necessary medical, dental or other treatment to children up to 16 years of age in need of and unable to procure the services and treatment referred to.

New York

Bills Introduced.—S. 1348 proposes that an applicant for a license to operate a motor vehicle must be examined by a physician at least once every three years and be certified to as physically fit to drive a motor vehicle. S. 1351 proposes that on the trial of any action arising out of acts alleged to have been committed by any person arrested for operating a motor vehicle while intoxicated, the court may admit evidence of the amount of alcohol in the defendant's blood, the test for which must be taken within two hours of the time of the arrest. Evidence that there was at that time 0.05 per cent or less by weight of alcohol in the blood is prima facie evidence that the defendant was not in an intoxicated condition sufficiently to lessen his driving ability. Evidence as to the presence of from 0.05 per cent to 0.15 per cent is relevant evidence but is not to be given prima facie effect in indicating the ability of the driver to operate the vehicle. Evidence as to 0.15 per cent, or more, is prima facie evidence that the defendant was in an intoxicated condition sufficiently to lessen his driving ability. S. 1395 proposes that the board of education of a city or school district maintaining vocational schools must provide health services for the pupils of such schools. The health service is to include the necessary personnel to afford adequate physical examination and is to include roentgenographing of the chest of pupils. S. 1409, to amend the provisions of the workmen's compensation act requiring a physician attending an injured worker to make designated progress reports, proposes to require the physician to

submit a progress report every two weeks, or at more frequent intervals if requested by the industrial commissioner. No claim for medical or surgical treatment is to be enforceable unless the progress reports are made. S. 1412 and A. 1760, to amend the workmen's compensation act, proposes that an injured employee may, when care is required for an injury to the foot, select to treat him any podiatrist authorized by the industrial commissioner to render podiatry care. S. 1418 and A. 1761, to amend the provisions of the medical practice act relating to the practice of physiotherapy, proposes that a person who has practiced physiotherapy under a license granted prior to July 1, 1930, who on submission of proper credentials or by satisfactory examination has shown that he has received sufficient instructions and training, may be granted the right to practice physiotherapy without being required to do so under the supervision of a duly licensed physician, as the present law requires.

WOMAN'S AUXILIARY

WINNERS IN THE HYGEIA CONTEST

The American Medical Association offered \$300 in cash prizes to the state and county auxiliaries which obtained the largest number of subscription credits to *Hygeia*. The contest covered the period from Oct. 1, 1939, to Jan. 31, 1940.

Cash prizes were awarded as follows:

Group 1. Auxiliaries with a membership of from one to thirteen:

First prize, \$35, to Childress-Collingsworth-Hall counties, Texas, Mrs. S. H. Townsend, Hygeia chairman, Childress, Texas.

For the second prize, \$20, no county qualified.

For the third prize, \$10, no county qualified.

Group 2. Auxiliaries with a membership of from fourteen to twenty-three:

First prize, \$35, to Baldwin County, Ga., Mrs. H. D. Allen Sr., Hygeia chairman, Milledgeville, Ga.

Second prize, \$20, to Chelan County, Wash., Mrs. A. G. Young, Hygeia chairman, Wenatchee, Wash.

Third prize, \$10, to Clark County, Wash., Mrs. C. B. Hutt, Hygeia chairman, Vancouver, Wash.

Group 3. Auxiliaries with a membership of from twenty-four to forty-two:

First prize, \$35, to Vermilion County, Ill., Mrs. G. W. Walbright, Hygeia chairman, Danville, Ill.

Second prize, \$20, to Will-Grundy County, Ill., Mrs. D. W. Killinger, Hygeia chairman, Joliet, Ill.

Third prize, \$10, to Duval County, Fla., Mrs. Raymond H. King, Hygeia chairman, Jacksonville, Fla.

Group 4. Auxiliaries with a membership of from forty-three to 669:

First prize, \$35, to Buchanan County, Mo., Mrs. Charles H. Werner, Hygeia chairman, St. Joseph, Mo.

Second prize, \$20, to Lehigh County, Pa., Mrs. Henry D. Jordan, Hygeia chairman, Allentown, Pa.

Third prize, \$10, to Cook County, Ill., Mrs. E. M. Egan, Hygeia chairman, Chicago.

State winners:

First prize, \$25, to state of Washington, Mrs. J. B. Robertson, Hygeia chairman, Tacoma, Wash.

Second prize, \$15, to state of Illinois, Mrs. W. J. Wanninger, Hygeia chairman, Chicago.

Honorable Mention was given to the following county chairmen:

Kern County, Calif., Mrs. Eric Colby, chairman, Bakersfield.
Dallas-Guthrie County, Iowa, Mrs. E. J. Butterfield, chairman, Dallas Center.

Cape Girardeau County, Mo., Mrs. A. M. Estes, chairman, Jackson.

Virginia

Bills Introduced.—S. 284 proposes to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic. The bill proposes to define chiropractic as "the philosophy, science and art of locating, any method preparatory to, and the adjustment of the articulation of the spinal column and adjacent bony structure to release the transmission of nerve energy to all parts of the body to correct the cause of disease." A licentiate is to be authorized to use such methods as are taught by chiropractic schools and colleges to further assist nature in establishing the normal transmission of nerve energy but is not to be entitled to use operative surgery, obstetrics, osteopathy nor to administer or prescribe any drug or medicine. H. 390 proposes to prohibit the operation of a maternity hospital unless licensed so to do by the state board of health.

Jackson County, Mo., Mrs. Ralph Myers, chairman, Kansas City.

LaFayette County, Mo., Mrs. C. T. Ryland, chairman, Lexington.

Lane County, Ore., Mrs. C. E. Hunt, chairman, Eugene.

Polk-Yamhill-Marion counties, Ore., Mrs. Burton A. Myers, chairman, Salem.

Fayette County, Pa., Mrs. John B. Hibbs, chairman, Uniontown.

Westmoreland County, Pa., Mrs. J. M. Mayhew, chairman, Greensburg.

Bowie-Miller County, Texas, Mrs. W. Decker Smith, chairman, Texarkana.

Salt Lake County, Utah, Mrs. Byron Rees, chairman, Salt Lake City.

Cowlitz County, Wash., Mrs. P. H. Henderson, chairman, Longview.

King County, Wash., Mrs. Hale Haven, chairman, Seattle.

Portage County, Wis., Mrs. Maurice G. Rice, chairman, Stevens Point.

Racine County, Wis., Mrs. F. B. Marek, chairman, Racine.

Sheboygan County, Wis., Mrs. A. J. Brickbauer, chairman, Plymouth.

Other counties that have reached or gone over their quota were:

Prairie County, Ark.; Arapahoe County, Colo.; Mesa County, Colo.; Bulloch-Evans-Chandler County, Ga.; Tift County, Ga.; Adams County, Ill.; St. Joseph County, Ind.; Dubuque County, Iowa; Cloud County, Kan.; Labette County, Kan.; Breathitt County, Ky.; Iberville Parish, La.; Washington Parish, La.; Washington County, Minn.; Alcorn County, Miss.; Omaha-Douglas County, Neb.; Cayuga County, N. Y.; Pottawatomie County, Okla.; Benton County, Ore.; Berks County, Pa.; Bucks County, Pa.; Huntingdon County, Pa.; Lebanon County, Pa.; Mifflin County, Pa.; Laurens County, S. C.; Hunt-Rockwall-Raines County, Texas; Kaufman County, Texas; Weber County, Utah; Kitsap County, Wash.; Pierce County, Wash.; Snohomish County, Wash.; Walla Walla County, Wash.; Whatcom County, Wash.; Kanawha County, W. Va.; Raleigh County, W. Va.; Rock County, Wis.; Washington-Ozaukee County, Wis.

The final result in this year's contest was 8,371 subscriptions, as against 6,242 received in the contest last year. The contest last year covered only the two months December 1938 and January 1939.

To the Hygeia chairmen, officers and members of the various county and state woman's auxiliaries who have assisted in making this contest a success, Mrs. Eben J. Carey, National Hygeia chairman, and the circulation manager of *Hygeia* express appreciation.

Medical News

MEDICAL NEWS

995

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Indian Service Hospital Closed.—The U. S. Indian Service Hospital at Fort Bidwell has been closed to patients. Owing to the extremely isolated location of the hospital, it has been found difficult to secure the continuous service of physicians. The personnel turnover has been unduly large and there have been many periods of time when no physician was available in the hospital by reason of lapses between assignments. The opening of Indian units at the Weimar Joint Sanatorium in Placer County and at the Wish-i-ah Sanatorium in Fresno County has made it possible to provide care for tuberculous Indians from northern California to better advantage than at the Fort Bidwell Hospital. General hospital care for the Indians in Modoc County will now be undertaken at local civil institutions. A generalized clinic and dispensary service under the charge of a full time Indian Service physician and public health nurse will be established at Alturas to provide dispensary care and public health services for the Indian population of the northeastern part of the state.

GEORGIA

University News.—Dr. Virgil P. W. Sydenstricker, professor of medicine, University of Georgia School of Medicine, Augusta, has been awarded a grant of \$6,000 by the Markle Foundation to continue his studies on pellagra.

District Meeting.—Among others, the speakers before the Sixth District Medical Society recently were Drs. Virgil P. W. Sydenstricker, Augusta, on "Conditions Associated with Deficiency of the B Group Vitamins" and David Henry Poer, Atlanta, "Use of Vitamin K as Preparation for Surgery in Common Duct Obstruction."

The Block Memorial Lecture.—Dr. Percival Bailey, professor of neurology and neurological surgery, University of Illinois College of Medicine, Chicago, will deliver the sixth annual E. Bates Block Memorial Lecture before the Fulton County Medical Society, Atlanta, March 18, on "Indications for Operations on Cases of Brain Tumor."

Society Honors Veteran Members.—At a recent meeting of the Fulton County Medical Society, Atlanta, certificates of honorary membership were presented to Drs. William L. Champion, Odom O. Fanning, John P. Kennedy, Pleasant L. Moon and Archibald Smith, Atlanta, and Michael Hoke, now of Beaufort, S. C. Certificates recognizing twenty-five years' membership in the society were presented to Drs. Thomas Blake Armstrong, William A. Arnold, Joseph Rex Barfield, Frank L. Eskridge, Henry Grady Estes, John B. Fitts, Harry N. Kraft, James Calhoun McDougall, Stephen C. Redd, Henry Clifford Sauls, Charles H. Paine, Atlanta; Kimsey E. Foster, College Park, and Chris H. Pinson, Hapeville.

ILLINOIS

Society News.—Dr. William Edward Chamberlain, Philadelphia, discussed "Pitfalls in X-Ray Diagnosis" before the Peoria City Medical Society on February 13.—Dr. Alfred J. Kobak, Chicago, discussed "Management of Prolonged Labor" before the Madison County Medical Society on February 2.—Dr. Leon Unger, Chicago, addressed the Macon County Medical Society in Decatur, January 30, on "Newer Phases of Migraine."—At a meeting of the Sangamon County Medical Society in Springfield, February 1, Dr. Lawrence S. Fallis, Detroit, discussed "The Technic of the Repair of Inguinal Hernia Including Fascial Transplants."

Chicago

Personal.—Dr. William H. Haines has been appointed assistant to Dr. Harry R. Hoffman, director of the Cook County Behavior Clinic. Dr. Haines is assistant clinical professor of neurology at Rush Medical College.

Society News.—Dr. Bela Schick, New York, will address the Chicago Society of Allergy, March 18, on "Allergy and Immunity."—A joint meeting of the Chicago Pediatric

Society and the Chicago Tuberculosis Society will be addressed, March 19, by Dr. Jay Arthur Myers, Minneapolis, on "Relationship of First Infection to Clinical Tuberculosis."—Dr. Frederic W. Bancroft, New York, will discuss "Traumatic Abdomen" before the Chicago Society of Industrial Medicine and Surgery, March 18.—Among others, Dr. Andrew F. M. deRoeth, Spokane, Wash., will speak on the "Hypofunction of the Lacrimal Gland" before the Chicago Ophthalmological Society, March 18.

Clinic on Necropsies.—An educational clinic, limited to members of the medical and funeral professions, will be held at the Stevens Hotel, March 19, under the auspices of the Chicago Medical Society, Institute of Medicine of Chicago, Chicago Pathological Society, Chicago Hospital Council, Cook County Hospital, Chicago Board of Health, coroner of Cook County, Chicago Association of Embalmers, and Funeral Services Associated. The program will include motion pictures on the technic employed in the performance of a complete autopsy and subsequent restoration of the subject by embalming. Lectures on the social, legal and technical aspects of the technic of subsequent restoration by embalming by F. A. Cutler, director of research and education, National Selected Morticians.

Dr. Max Cutler Honored.—Dr. Max Cutler, director of the Chicago Tumor Institute, will be honored at an all day meeting on the cure and control of cancer in Atlanta, Ga., March 29. The sessions will start at 10 a. m. in the Henry Grady Hotel and will be under the sponsorship of the state department of health, the Cancer Commission of the state Association of Georgia and the Georgia Division of the Women's Field Army of the American Society for the Control of Cancer. Principal speakers at the morning session will be Dr. Cutler and Dr. Leonard A. Scheele, U. S. Public Health Service, Washington, D. C., who will discuss "Early Diagnosis and Treatment of Cancer" and "Cancer as a Public Health Problem" respectively. In the afternoon a conference on the diagnosis and treatment of cancer with the exhibition of cases will be held at the Sheffield Cancer Clinic of the Georgia Baptist Hospital. In the evening Dr. Cutler will be presented with an official citation by Governor Rivers in recognition of his "outstanding achievement in the realm of cancer cure and control." At the same time he will be appointed an honorary lieutenant colonel on the military staff of the governor. Dr. Cutler formerly lived in Athens and graduated at the University of Georgia in 1918.

MASSACHUSETTS

Society News.—At a meeting of the New England Society of Physical Medicine, February 28, a symposium on the treatment of arthritis was presented by Drs. James Sydney Stillman Jr., Jose P. Bill, Herman A. Osgood and Loring T. Swaim, Boston.—Dr. William Malamud discussed "The Problem of the Neuroses in General Practice" before the Worcester District Medical Society, February 14, and Saul Rosenzweig, Ph.D., "Experimental Neurosis."—Civic and other agencies are cooperating in the second Worcester Health Week, February 25-March 2, initiated by the Worcester

New Department of Anatomy at Tufts.—Dr. and Mrs. George G. Averill, Waterville, Maine, have given \$42,200 to the Tufts College Medical School, Boston, to establish the "Dr. and Mrs. George G. Averill Department of Anatomy in Memory of Prof. Charles P. Thayer." Dr. Thayer was one of the "original seven" founders of the school in 1893 and first head of the anatomy department. Dr. Averill graduated from Tufts in 1896. The gift will provide the entire top floor of a new medical school building which will be situated in downtown Boston at the New England Medical Center. The gift will be made available during 1940 and 1941, the announcement stated.

MISSISSIPPI

Hospital News.—The new Beacham Memorial Hospital was dedicated at Magnolia recently with Dr. Rudolph Matas, New Orleans, giving the principal address.

Society News.—Members of the faculty of the University of Mississippi School of Medicine, University, recently presented the following program before the Clarkdale and Six Counties Medical Society at Clarkdale: Dr. Robert M. Moore, "Mortality in Appendicitis"; David S. Pankratz, "Influence of Barbiturates on the Gravid Uterus"; James B. Loooper, "Treatment of Narcolepsy"; Vernon B. Harrison,

"Diagnosis of Gonorrhea"; Eugene V. Bramlett, "Leukorrhea"; James R. Simms Jr., "Conservative Treatment of Pelvic Inflammatory Disease"; Wilbur F. Potter, Ph.D., "Cardiac Physiology," and Robert P. Walton, Ph.D., "Pharmacology of Cardiac Drugs."

Personal.—Drs. W. H. Banks, Philadelphia, and Samuel E. Eason, New Albany, were recently appointed members of the state board of health for five year terms.—Dr. Byron O. Garner, Greenwood, of the Adams County Health Department, has been appointed temporary health officer in LeFlore County, filling the vacancy caused by the death of Dr. Levi A. Barnett, Greenwood.—Dr. Isaac C. Farmer, formerly of Mendenhall, has been selected to be health officer of the newly formed health unit in Tate County with headquarters in Senatobia.—Dr. Francis S. Dixon has been appointed superintendent of the Natchez Charity Hospital in Natchez, succeeding Dr. Louis M. Magee, resigned.

NEW JERSEY

Society News.—Dr. William Wayne Babcock, Philadelphia, addressed the Essex County Medical Society, Newark, March 14, on "Surgical Considerations in Intestinal Obstruction."—Dr. Horace J. Williams, Philadelphia, addressed the Camden County Medical Society, Camden, March 5, on "Otitis Media and Mastoiditis."—Dr. Leon Herman, Philadelphia, will address the Academy of Medicine of Northern New Jersey, Newark, March 21, on "Urogenital Tuberculosis." Dr. Alfred W. Adson, Rochester, Minn., presented a paper before the section on medicine and pediatrics, March 12, on "Diagnosis and Treatment of Recurring Sciatica."

NEW YORK

State Society Moves.—Offices of the Medical Society of the State of New York, which have been in the building of the New York Academy of Medicine since 1926, have been moved to an entire floor in the Research Institute Building, 292 Madison Avenue, New York.

Physician Leaves Fund for New Building.—Dr. Dewitt H. Sherman, for many years professor of pediatrics at the University of Buffalo School of Medicine, left a bequest of about \$225,000 to the university for a new medical building, according to the *New York State Journal of Medicine*. In addition, Mrs. Sherman has made a gift of \$200,000 for the fund. Dr. Sherman died February 1.

Buffalo Clinical Day.—The University of Buffalo School of Medicine will sponsor the Sixth Annual Clinical Day, April 20, with the following guest speakers:

- Dr. Newton D. Smith, Rochester, Minn., The General Practitioner's Anorectal Problems.
- Dr. James G. Carr, Chicago, Obscure Fever.
- Dr. Albert M. Snell, Rochester, Minn., Some Problems Presented by the Jaundiced Patient.
- Dr. Henry M. Thomas Jr., Baltimore, Hypertension: The Modern Conception of Its Causes and the Results of Medical and Surgical Treatment.
- Dr. Temple S. Fay, Philadelphia, Observations on Human Refrigeration.

New York City

Sixth Harvey Lecture.—René J. Dubos, Ph.D., associate member, Rockefeller Institute for Medical Research, will deliver the sixth Harvey Society Lecture of the current series at the New York Academy of Medicine, March 21. His subject will be "Utilization of Selective Microbial Agents in the Study of Biological Problems."

In Memory of Dr. Farrand.—A memorial meeting in honor of the late Dr. Livingston Farrand was held at the New York Academy of Medicine on January 30 under the auspices of various organizations with which Dr. Farrand was associated. The speakers were:

- Charles F. W. McClure, Sc.D., Princeton, N. J., representing the class of 1888 at Princeton University, of which Dr. Farrand was a member.
- Dr. Charles J. Hatfield, Philadelphia, the National Tuberculosis Association.
- Homer Folks, LL.D., the Rockefeller Tuberculosis Commission in France.
- Eliot Wadsworth, LL.D., Boston, the American Red Cross.
- Albert R. Mann, LL.D., Cornell University.
- Dr. James Ewing, Cornell University Medical College.
- Albert G. Milbank of the Milbank Memorial Fund, whose address was read by Dr. Frank G. Boudreau.
- Dr. Thomas Parran, Washington, D. C., the U. S. Public Health Service.
- Dr. Simon Flexner, the Public Health Council of the State of New York.
- Barklie Henry, the New York Hospital.
- George E. Vincent, Ph.D., the Rockefeller Foundation.

OHIO

University News.—Dr. Leonard G. Rowntree, Philadelphia, will deliver the Roger Morris Memorial Lecture for 1940 at the University of Cincinnati College of Medicine, March 25. Dr. Rowntree's subject will be "The Suprarenal Gland and Its Diseases."

Personal.—Dr. Claude V. Davis, Pennsville, has been appointed a member of the state medical board to succeed the late Dr. Lee Humphrey, Malta.—Dr. Benjamin W. Dudley Keever, Centerville, was honored by the Montgomery County Medical Society at a meeting in Dayton, January 15, on his completion of fifty-five years of practice. The society gave him a fountain pen and pencil set.—Dr. Howard Dittick, Cleveland, has been appointed editor of *Current Researches in Anesthesia and Analgesia*, succeeding the late Dr. Francis Hoeffler McMechan, Rocky River.

OREGON

New Health Officers.—Dr. Frederick T. Burke, Timber, has been appointed health officer of Washington County, succeeding Dr. Richard N. Sherwin, Hillsboro, who resigned.—Dr. Charles J. Hedlund, formerly of Atwater, Minn., has been appointed health officer of a new health unit in Baker County.

Personal.—Dr. John E. Weeks, Portland, has been appointed honorary professor of ophthalmology at the University of Oregon Medical School, Portland. Dr. Weeks, now 86 years old, was for many years professor of ophthalmology at University and Bellevue Hospital Medical College, New York, and has been professor emeritus since 1920. He was chairman of the Section on Ophthalmology of the American Medical Association in 1902 and president of the American Ophthalmological Society in 1923.

PENNSYLVANIA

Hospital News.—A new \$600,000 children's preventorium was placed in operation recently at the Pennsylvania State Tuberculosis Sanatorium at South Mountain in Franklin County. The building will accommodate 340 children; 215 were moved into it from the old buildings.

Medical Service Plan Approved.—The house of delegates of the Medical Society of the State of Pennsylvania at a special meeting in Harrisburg, February 28, voted to establish a low cost medical service plan for wage earners in the lower income brackets. The plan would be put in operation first in the fifth councilor district, including Dauphin, Cumberland, Lebanon, York, Adams, Lancaster, Franklin, Fulton and Perry counties. Rates, as reported in a newspaper account, will be \$2.50 a month for a single member, \$2 additional for his wife, \$1.50 additional for one child and \$1 for each additional child.

Society News.—Dr. Julius M. Rogoff, Pittsburgh, addressed the annual combined dinner meeting of the Valley Medical Society and the McKeesport Academy of Medicine, February 26, on "Endocrinology: Its Present Status."—Dr. William A. Marsh, Mount Pleasant, among others, addressed the Westmoreland County Medical Society, March 5, at the Mountain View Hotel near Greensburg on "Treatment of Hip Joint Fracture in the Aged."—Dr. Tom Outland, Elizabethtown, addressed the Dauphin County Medical Society, Harrisburg, March 5, on "Treatment of Compressed Fracture of the Spine."—Dr. Joseph C. Yaskin, Philadelphia, addressed the Harrisburg Academy of Medicine, February 20, on "Painful Conditions Related to the Peripheral Nerves and Their Roots."

Philadelphia

Meeting on Cancer.—The Philadelphia County Medical Society devoted its meeting, March 13, to a program on cancer. The speakers were William U. Gardner, Ph.D., New Haven, Conn., on "Relation of Hormones to Cancer"; Drs. Edmund P. Halley, Decatur, Ill., "Preoperative Irradiation in Breast Carcinoma with Microscopic Studies"; Catharine Marfarlane, "An Experiment in Cancer Control," and Stanley P. Reimann, progress report from the division of cancer control, Pennsylvania Department of Health.

Society News.—Dr. Oscar V. Batson addressed the Philadelphia Laryngological Society, March 5, on "The Circulation of the Head, Especially Venous, with Reference to Osteomyelitis, Brain Abscess and Malignant Metastasis."—Dr. Alvin F. Coburn, New York, addressed the College of Physicians of Philadelphia, March 6, on "Faulty Handling of Streptococcus Haemolyticus in Relation to the Development of the Rheumatic Lesion."—Speakers at a meeting of the Obstetrical Society of Philadelphia, March 7, were Drs. Newlin F. Paxson on "Chronic Nephritis and Pregnancy," and Franklin L. Payne

and Craig W. Muckle, "Clinical Experience with Stilbestrol."—Dr. Readie Garfield Snyder, New York, addressed the Philadelphia Rheumatism Society, March 7, on "Therapy of Chronic Arthritis; Including a Discussion of the Use of Gold Salts and a Preliminary Report on the Use of Activated Ergosterol."

TEXAS

Dallas Hospital Institute.—The Dallas County Hospital Council is sponsoring a hospital institute in Dallas during the week of April 8 for employees of the member hospitals. Meetings will be held every evening at St. Paul Hospital, with papers covering many phases of hospital activity, followed by panel and round table discussion. Speakers are drawn from local hospitals. Twenty-four institutions are affiliated with the hospital council. Hospital employees in adjacent communities have been invited to attend. Mr. A. C. Seawell, assistant superintendent of the Baylor Hospital, is president of the council.

Society News.—Drs. Thomas E. Smith and James H. Herndon addressed the Dallas County Medical Society, Dallas, February 8, on "Surgical Treatment of Hemorrhoids" and "Typhus Fever" respectively. Speakers before the society, March 28, will be Drs. Charles D. Bussey, on "Gastrojejunal Ulcer—A Sequel to Gastric Surgery"; Milford O. Rouse and Cecil O. Patterson, "Foreign Bodies in the Stomach as Observed Through the Flexible Gastroscope," and Walter G. Reddick, "Treatment of Pneumonia with Sulfanilamide, Sulfapyridine and Sulfathiazol."—Drs. William W. Fowler and Max H. Grow, Dallas, addressed the Denton County Medical Society, February 1, on "Diagnosis and Treatment of the Ophthalmological and Rhinological Manifestations of Allergy" and "Allergy in Childhood" respectively.

WASHINGTON

Puget Sound Surgical Society.—Dr. Howard K. Gray, Rochester, Minn., was the guest speaker at the annual meeting of the Puget Sound Surgical Society in Seattle, March 8-9. At a dinner Friday evening, March 9, at the Rainier Club Dr. Gray made an address on "Problems Associated with Occlusive Diseases of the Extrahepatic Bile Ducts." He conducted clinics Saturday at the King County Hospital and at the formal banquet in the evening spoke on "Significance and Surgical Management of Ulcerating and Neoplastic Lesions of the Stomach."

Society News.—Dr. Owen H. Wangenstein, Minneapolis, will be the guest speaker at the annual meeting of the Tacoma Surgical Club, March 23. The general subject for the day will be "Complications of Abdominal Surgery."—A symposium on mental diseases was presented at a meeting of the Spokane County Medical Society, Spokane, February 8, by Drs. Marinus W. Conway, Harry N. Roback, Cecilia E. Schlotthauer, Herbert A. Perry and Charles W. Miller Jr., all of the staff of the Eastern State Hospital, Medical Lake.—Dr. Herbert E. Coe, Seattle, addressed the Walla Walla Valley Medical Society, Walla Walla, February 14, on developmental and congenital defects.—Dr. Carl P. Wagoner, Seattle, addressed the Pierce County Medical Society, Tacoma, February 13, on "The Common Cold."

WISCONSIN

District Meeting.—The Ninth Councilor District Medical Society held its winter meeting in Wisconsin Rapids on January 25 with the following speakers: Drs. Lyman A. Capps, Marshfield, on "External Eye Diseases"; Allen L. Millard, Marshfield, "Pericarditis," and Ovid O. Meyer, Madison, "Recent Advances in Hematology."

University News.—Dr. Walter Freeman, Washington, D. C., addressed the University of Wisconsin Medical Society, Madison, February 14, on "Experiences in the Treatment of Schizophrenia by Means of Prefrontal Lobotomy." Dr. James W. Kernohan, Rochester, Minn., gave a lecture under the auspices of Alpha Omega Alpha at the university, March 8, on "Cerebral Changes Associated with Endocarditis."

Society News.—Drs. Mandred W. Comfort and Howard K. Gray, Rochester, Minn., discussed medical and surgical aspects, respectively, of diseases of the gallbladder and surgical treatment of the gallbladder at a meeting of the Polk County Medical Society, Balsam Lake, January 18.—Drs. Henry A. Sincok and James W. McGill, Superior, addressed the Chippewa County Medical Society, Chippewa Falls, January 23, on "The Practical Problem of the Physician Doing a Combined Obstetric and Pediatric Practice" and "Con-

traction Ring Dystocia" respectively.—Dr. Joseph M. King, Milwaukee, addressed the Fond du Lac County Medical Society, Fond du Lac, January 18, on "Hand Infections."—Dr. Frederick A. Collier, Ann Arbor, Mich., was the guest speaker at the meeting of the Medical Society of Milwaukee County, February 9, on "The Diagnosis of Acute Abdominal Surgical Lesions."—Dr. Albert D. Kaiser, Rochester, N. Y., addressed the Milwaukee Pediatric Society, February 14, on "The Tonsil Question" and Dr. Francis D. Murphy, Milwaukee, on "The Fluid Balance."

GENERAL

Meetings in Pittsburgh in March.—The American Association of Pathologists and Bacteriologists will have its fortieth annual meeting in Pittsburgh at the Mellon Institute, March 21-22. Among more than fifty papers will be the following:

Dr. Frank L. Apperly, Richmond, Va., The Significance of the Varying Distribution of Cancer in North America.
Drs. John T. Bauer and Paul H. Schraer, Philadelphia, Late Pathologic Effect of High Voltage X-Rays on the Human Lung.
Dr. Stuart W. Lippincott, Montreal, Canada, Histopathologic Studies on a Fatal Case of Hypervitaminosis D.
Dr. Simeon Burt Wollbach, Otto A. Bessey, Ph.D., and Dr. Roy L. Swank, Boston, Vitamin Deficiency and Lesions of the Nervous System.
Drs. Robert C. Grauer, Chester F. Beall and George R. Wilson, Pittsburgh, Endometrial Response to Stilbestrol in Radium Menopause.
Drs. George R. Lacy and Mortimer Cohen, Pittsburgh, The Bacteriology of Postpartum Febrile Conditions.
William H. Feldman, D.V.M., and Dr. Henry F. Helmholz, Rochester, Minn., The Presence of Viable Tubercle Bacilli in Lesions of the Ghon Complex of Children.
Dr. Warren C. Hunter, Portland, Ore., Etiology, Incidence and Fate of Deep Leg Vein Thrombosis in 300 Unselected Autopsies.

The American Association for Cancer Research will meet at the Mellon Institute, March 19-20, with the following speakers, among others:

Dr. Emmerich V. Haam and Leona Cappel, Columbus, Ohio, The Influence of Hormones Upon Cells Grown in Tissue Culture.
Dr. Joseph H. Farrow, New York, Treatment of Inoperable Carcinoma of the Breast with Testosterone Propionate.
Murray J. Shear, Ph.D., and Dr. Harold L. Stewart, Bethesda, Md., Carcinogenic Activity of Nitrogen-Containing Benzene Derivatives.
Drs. Michael B. Shimkin and Hugh G. Grady, Bethesda, Md., Carcinogenicity of Stilbestrol and Estrone.
Fritz Bischoff, Ph.D., M. Louisa Long and Dr. John Jerome Rupp, Santa Barbara, Calif., Influence of Induced Hibernation on the Growth Behavior of Mouse Neoplasms.

The American and Canadian Section of the International Association of Medical Museums will hold its thirty-third annual meeting March 20, with an exhibition at Mellon Institute for the benefit of all the societies, March 20-22. A special feature of the program will be a symposium on the use of plastics in museum work. Col. James E. Ash, curator of the Army Medical Museum, Washington, D. C., is president of the section.

American College of Physicians.—The twenty-fourth annual session of the American College of Physicians will be held in Cleveland, April 1-5, with headquarters at the Cleveland Public Auditorium and under the presidency of Dr. Oliver H. Perry Pepper, Philadelphia. The annual convocation will be Wednesday evening, April 3, when Dr. Pepper will give his official address; Dr. Charles F. Martin, emeritus dean and emeritus professor of medicine, McGill University Faculty of Medicine, Montreal, Canada, will give the convocation address, and the John Phillips Memorial Medal will be presented to René J. Dubos, Ph.D., New York. One general session will be devoted to a symposium on military medicine with speakers from the U. S. Army and Navy. Among the speakers at other sessions will be:

Drs. Joseph Kaufmann and Louis Lowenstein, Montreal, A Study of the Acute Leukoses.
Drs. Harrison F. Flippin and Leon Schwartz, Philadelphia, The Comparative Effectiveness of Sulfathiazol and Sulfapyridine in Pneumococcal Pneumonia.
Dr. Everett N. Collins, Cleveland, Treatment of Ulcerative Colitis with Sulfanilamide.
Dr. George W. Thorn, Baltimore, The Role of the Gonadal and Adrenal Cortical Hormones in the Production of Edema.
René J. Dubos, Ph.D., New York, The Effect of Specific Agents Extracted from Soil Micro-Organisms Upon Experimental Bacterial Infections.
Drs. Henry Field Jr., William D. Robinson and Daniel Melnick, Ph.D., Ann Arbor, Mich., Vitamins and Peptic Ulcer.
Dr. Edward L. Bortz, Philadelphia, Social Components in Medicine.
Dr. Mark P. Schultz, U. S. Public Health Service, Washington, D. C., Blood Cholesterol in Rheumatic Fever.
Dr. George Gill Richards, Salt Lake City, Tularemia Pneumonia.
Drs. Louis E. Friedman and Herman J. Moersch, Rochester, Minn., Bronchostenosis Complicating Allergic and Infectious Asthma.

General sessions will be held in the afternoons with the exception of the symposium on military medicine, which will be Monday evening. Mornings will be devoted to clinics and demonstrations in Cleveland hospitals and to lectures at the auditorium. A program of panel discussions will be presented

each afternoon just before the general sessions. The annual banquet will be Thursday evening, with Dr. Howard T. Karsner, Cleveland, as toastmaster and Mr. Grove Patterson, editor of the Toledo *Blade*, as the speaker.

Bequests and Donations.—The following bequests and donations have recently been announced:

Children's Memorial Hospital, Chicago, \$25,000 by the will of Mrs. Della Ross Stack.

International Cancer Research Foundation, Philadelphia, \$100,000 (with the exception of a few minor bequests) from the will of the late Mrs. Gertrude Wellington as a memorial to her husband, who died of cancer.

University of Pennsylvania Hospital, Philadelphia, \$15,000 to endow a free room and a free bed.

Jewish Hospital, Philadelphia, \$2,000 by the will of the late Bernard Selig.

St. Christopher's Hospital for Children, Philadelphia, \$3,000 by the will of the late Elijah Dallett.

Lankenau Hospital, Philadelphia, \$5,000 from the estate of William H. Norris after the remarriage or death of his widow, and \$10,000 for maintenance of two beds by the will of the late Julia Preuss.

Quakertown Hospital, Quakertown, Pa., \$10,000 from the estate of Miss Emma Roeder and \$2,500 from the estate of a Miss Sterner.

Presbyterian and Lankenau hospitals, Philadelphia, will share approximately \$8,500 from the estate of Miss Minerva Booth, following a settlement in the Orphans' Court.

Government Services

Army Experience for Physicians

Physicians under 35 years of age who are desirous of obtaining extended active duty with the army but who do not hold reserve commissions are being offered appointments in the Medical Corps Reserve in the grade of first lieutenant, in order to permit them to be placed on such duty. Captains and lieutenants are at present being offered excellent assignments throughout continental United States, and it is hoped that authority will be granted to permit some officers to go to Hawaii and Panama. In addition to having a new and busy experience in the practice of medicine, the average officer finds the pay and allowances attractive. The pay and allowances for a married first lieutenant amount to approximately \$263 a month; for a single first lieutenant to approximately \$225 a month; for a married captain to approximately \$316 a month, and for a single captain to approximately \$278 a month. In most cases the pay and allowances would apply, as government quarters are not usually available for officers on extended active duty. In the few instances in which government quarters are available, the amounts would be \$40, \$60, \$60 and \$80 less per month respectively. In addition, the officer is reimbursed for mileage traveled from his home to his station, and on completion of his tour of duty he is reimbursed similarly for the travel to his home.

Application for one year of active duty, or for appointment in the Medical Corps Reserve with a view to obtaining one year of active duty with the army, should be requested at once by a letter addressed to the commanding general of the corps area wherein the physician permanently resides. In addition, the application should contain concise information regarding permanent address, temporary address, number of dependents, earliest date available for active duty, and the fact that internship has been (or will be) completed; it should be accompanied by a report of physical examination recorded on the army form W. D. A. G. O. 63, which may be obtained from any army station. From the group of reserve officers placed on extended active duty since August 1939, more than 25 per cent of those within the age requirements of 32 years of age or less for commission in the regular army Medical Corps found military service sufficiently to their liking to cause them to take entrance examinations for the regular army. Corps areas and their headquarters are as follows:

First Corps Area (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut), Army Base, Boston, 9.

Second Corps Area (New York, New Jersey, Delaware), Governor's Island, New York.

Third Corps Area (Pennsylvania, Maryland, Virginia, District of Columbia), Post Office and Court House, Baltimore.

Fourth Corps Area (North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, Louisiana), Post Office Building, Atlanta, Ga.

Fifth Corps Area (Ohio, West Virginia, Indiana, Kentucky), Fort Hayes, Columbus, Ohio.

Sixth Corps Area (Illinois, Michigan, Wisconsin), Post Office Building, Chicago.

Seventh Corps Area (Missouri, Kansas, Arkansas, Iowa, Nebraska, Minnesota, North Dakota, South Dakota), New Federal Building, Omaha.

Eighth Corps Area (Texas, Oklahoma, Colorado, New Mexico, Arizona), Fort Sam Houston, San Antonio, Texas.

Ninth Corps Area (Washington, Oregon, Idaho, Montana, Wyoming, Utah, Nevada, California), Presidio of San Francisco, San Francisco.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 10, 1940.

The Medical Profession and the War

A Central Medical War Committee, representing all branches of the medical profession, has been set up under government plans. To this committee the government refers all questions regarding the supply of medical personnel arising out of the war. It satisfies the demands for this personnel both for the civil population and for central and local government authorities. In every area of the country there is a local medical war committee through which the central committee operates. The local committees will be reelected next March and thereafter annually. Before allocating a practitioner for national service, the central committee consults the local committee of the area in which the practitioner resides. The demand is distributed in the form of quotas among the local committees, regard being paid to such local factors as density of population and proportion of practitioners in the area. The local committee satisfies the quota in such a way as will secure the least interference with local medical services and the greatest possible regard to the wishes of the individual practitioner. Similarly, demands for specialist personnel are received from the services in numerical form for surgeons, anesthetists, dermatologists, venereologists, psychologists, radiologists and so on. The central committee satisfies itself as to the specialist qualifications and experience of the individuals before recommending them for appointment. But in the case of London practitioners a committee of the royal colleges, known as the Committee of Reference, has the responsibility of approval.

At present no practitioner can be allocated to the services without his consent. This arrangement will continue as long as the whole medical profession is included in "the reserved occupations." But conscription may be applied to the medical profession. If and when this occurs, it is anticipated that the same central and local arrangements will continue and regard be paid to the wishes of practitioners, though the needs of the country must be paramount. Heavy demands for medical personnel for general duty with the forces are now being received. The scheme of the British Medical Association for the protection of practitioners for whole time war service is in general operation.

The Medical Uses of Radium

The Medical Research Council has published a summary of the research work done with radium or radon during 1938 at more than twenty hospitals and other institutions, most of which hold radium on loan from the council. The discovery of neutron in 1932 and of artificial radioactivity in 1934 aroused great interest. But the prediction that artificial radioactive bodies would replace radium is not yet in sight of fulfillment. One of the council's staff, Dr. F. G. Spear, joined in a biologic research on neutron action from October 1938 to March 1939 with Prof. John H. Lawrence in California, where the first cyclotron was installed. As a result of his report facilities are to be provided in this country for research on neutron irradiation by means of a cyclotron.

CANCER OF THE BREAST

At the Marie Curie Hospital, London, removal is advocated in operable cases. Cases considered to be on the borderline of operability are given preoperative roentgen treatment followed by removal. Either a lethal dose is given, followed by operation several months afterward, or a modified x-ray dose is followed by operation in from seven to ten days. Whether subsequent postoperative treatment is given depends on the clinical and pathologic appearance. The mode of access is by two fields,

one medial and the other lateral, to include the breast and the axilla. Inoperable cases are generally treated by x-rays. A few have been given interstitial radium or a combination of the two. Recurrences are treated mainly by x-rays or telerradium.

At St. Bartholomew's Hospital a histologic investigation of the effects of radium, begun in 1932, has been completed. Of fifty specimens of breast and axillary contents removed three months after radium had been inserted, active-looking carcinoma cells were present in ten, degenerate cells in seventeen and no residual growth in the remaining twenty-three. There is some evidence that gland deposits vary, like the primary growth, in their response to radium. Although there were several striking cases in which large axillary metastases disappeared, fourteen of fifty specimens showed active growth in the glands three months after what had been regarded as adequate irradiation.

CANCER OF THE LARYNX

The Birmingham General Hospital reports that since 1934 all cases of intrinsic cancer of the larynx considered suitable have been treated by the fenestration method associated with the names of Finzi and Harman and that this has given good results in several cases of precancerous conditions of the larynx. This operation is considered to have a wider field than laryngofissure. It has been extensively applied to neoplasms which have not only invaded one cord but have extended round the commissure to the other. The technic consists in exposure of the thyroid ala and cutting a window subperichondrially in the cartilage so as to accommodate from eight to ten needles, each containing 1 mg. of radium, placed side by side across it. At the original operation difficulty was found in getting the skin incision to heal. This has been overcome by smearing the site of implantation with a paste of bismuth subnitrate and iodoform.

TELERRADIUM THERAPY

The most extensive investigation of telerradium therapy has been at the Radium Institute, London. The volume of tissue irradiated has comprised the primary growth and its probable direction of spread. The direction of the beam is so determined that a homogeneous radiation is delivered to the whole of this tissue block. To minimize the total amount of radiation delivered to the patient's body, the primary growth is irradiated through the glandular regions. A dose of from 5,000 to 8,000 roentgens has been delivered in forty-two days. When the growth is early and localized, complete disappearance can be expected. Affected lymphatic glands in close proximity also disappear. When the primary growth and the glands are in an advanced and inoperable stage, the disease can be made to disappear in a small proportion of cases and distressing symptoms may be relieved in a large proportion. It is too early to make definite pronouncements, but it appears that the treatment of carcinoma of the mouth and throat by the radium beam is at least as satisfactory as by surgery or interstitial radium. In cancer of the breast the beam is directed to the primary growth by glancing fields across the surface of the body so as to avoid overirradiation of the structures beneath the breast.

BERLIN

(From Our Regular Correspondent)

Jan. 27, 1940.

Speed Acceleration During Flight

Dr. Gauer recently discussed in *Der deutsche Militärarzt* the effect of speed acceleration on air pilots. He said that the least indisposition of the pilot, lasting less than a second, is sufficient to produce a catastrophe, in view of the fact that even under optimal conditions of a normal reaction time of 0.2 second the airship at a speed of 600 kilometers an hour covers a distance of 30 meters unsteered before the pilot, guided by optical sense impressions, is able to maneuver. The cause of the disturbances which may arise does not lie in the speed itself but in the centrifugal force involved. Experiments made during recent

years showed that endurance depends chiefly on the magnitude of centrifugal force, on its direction and duration, on individual variations and on the position of the pilot. At the heart of the problem are the changes in hydrostatic pressure in the vascular system. Strenuous flights should not be taken without a breakfast. To take off on an empty stomach or on only a cup of tea or a cigaret, as is usually done, means a decided loss of power of resistance in the endurance of speed acceleration. It is safer to avoid as much as possible the action of centrifugal force than to resist it by increasing vascular regulation. The best course is to place the pilot in his ship on his back or his stomach. The circulation can then endure great speed acceleration without strain. However, the technical difficulties of placing the pilot in a dorsal or ventral position are immense. An increased power of resistance cannot be acquired by training. During the progress of infectious diseases, and immediately after, the power to resist the action of centrifugal force is low, no matter whether the infection is relatively harmless or not. The limits of human endurance of speed acceleration in air navigation have not yet been reached.

Insulin Shock Therapy

Dr. Büdingen reported to the Berlin society of psychiatrists and neurologists the results obtained with insulin shock therapy in the free psychiatric clinic of the University of Berlin. Insulin was given to 134 patients, fourteen of whom were nonschizophrenic. Complete remissions amounted to 11.2 per cent, social remissions to 16.4 per cent, amelioration to 17.1 per cent and no influence to 55.3 per cent. If nonschizophrenic cases are excluded, 61.7 per cent remained uninfluenced. The treatments were carried out strictly according to Sakel's procedure and lasted on the average three months. Improvements were often only transient. Büdingen regards insulin therapy as contra-indicated in true schizophrenia but indicated in cases of psychosis that show symptoms occurring in schizophrenia but which, according to their complete clinical picture, require different classification.

Gonorrheal Arthritis Secondary to Blood Transfusion

At the Children's Hospital in Cluj, A. Jancu, C. Oprisiu and N. Dominovicu in the *Monatsschrift für Kinderheilkunde* reported the case of a male infant aged 8 months, suffering from furunculosis. Two transfusions of the mother's blood were undertaken. Four days later the infant's temperature rose and painful swellings of several joints set in. An exploratory puncture disclosed gonococci. The infant was treated with azosulfamide and the condition healed except for a few traces. The infant's mother had been suffering from arthritis for nine years, a sequel to gonorrhea. No gonococci were found in her blood. In spite of this negative finding the child's arthritis must be attributed to the blood transfusions, because determination of gonococci in the blood is rarely successful.

Personal

Prof. Ludwig Fraenkel, former professor of gynecology and obstetrics in Breslau, completed his seventieth birthday April 23. A pupil of the pathologic anatomist Grawitz and of gynecologists Hegar, Sänger and W. A. Freund, he began his academic career in Breslau in 1905 and became associate professor in 1909 and full professor and director of the university woman's clinic in 1922. In 1934 he, like many others, was retired. Fraenkel's scientific contributions in his field deal with the function of the corpus luteum, hydatid moles, chorioma, placenta praevia, ovulation and menstruation. His monographs on the normal and pathologic sex physiology in woman, the physiology of female genital organs and clinical pathology of tumors of endocrine glands in relation to the genital system and his books on social obstetrics and gynecology (1928) and the prevention of conception (1932) were much discussed. Fraenkel, whose

personality and ability as a clinician and teacher are greatly esteemed and who lectured in the United States on several occasions, is now living in Montevideo, Uruguay, and is active as a gynecologic consultant. A dedicatory issue of the *Anales de la Facultad de Medicina de Montevideo* is in preparation, in which also North American physicians are largely represented.

STOCKHOLM

(From a Special Correspondent)

Jan. 7, 1940.

The Transport of the Sick and Injured

The problem of motor ambulance services throughout Sweden has of late been tackled from several angles, and many of the advances made must be put to the credit of Surgeon General (retired) Fritz Bauer, whose activity in this field has been ceaseless. The Hospital Standardization Committee and the National Red Cross Society first explored the possibilities of providing the country, rural areas included, with an efficient network of motor ambulances. But, as the years passed and the toll of the roads mounted every year, it became obvious that the motor ambulance was by itself a too costly solution of the problem. Attention was therefore turned to other possibilities, such as the conversion of motor busses, motor lorries and motor cars, both private and for hire, into extemporized motor ambulances. It is particularly the ordinary motor car which at the present time is receiving attention as the most likely key to the riddle.

There are already some 300 motor cars in Sweden fitted so as to be converted into extemporized motor ambulances in an emergency, and among the taxicabs in Stockholm there are twenty-five which can serve this purpose. Their owners are under contract with the Stockholm hospital service to turn them into motor ambulances when required. Surgeon General Bauer advises the prospective purchasers of private motor cars to stipulate with the makers for the necessary fittings without any extra charge. When a car has already been purchased, and when it conforms to the standardized requirements of extemporized motor ambulances, it is possible to make the necessary changes at a cost of less than 100 kronor (\$24). The standardized stretcher need not cost more than from 60 to 70 kronor (about \$15). A four seater can be fitted to take one recumbent patient on the stretcher in addition to one person sitting up and the driver. A seven seater can be made to accommodate one stretcher patient and three persons sitting up, as well as the driver. Alternative disposals of the stretcher have been devised, but the most effective system is the one in which the stretcher is introduced into the car from behind and is secured to the floor of the car. Under the guidance of Dr. Rolf Bergman, who is in charge of the fever hospital of Stockholm, instructions have been drafted for the disinfection of extemporized motor ambulances after they have conveyed infectious cases. These instructions are printed on the back of the contract between the car owner and the hospital authorities.

The Frequency of Mild Chronic Encephalitis

In the old university town of Lund, Prof. Henrik Sjöbring has for several years made his psychiatric clinic a remarkably effective clearing house for all sorts and conditions of ailments for which only a generation ago there would have been no appropriate labels. To be sure, the process of labeling is at times still somewhat tentative, and the dividing line between functional psychoses and psychoses with an organic basis is not always as clearcut as one would like. Every patient attending this clinic undergoes an analysis of his personality with a view to its basic features, before the development of serious symptoms, being made clear. Such an analysis is often helpful in linking up troublesome symptoms of the present with constitutional characteristics in the past. As the weeding out proceeds, it becomes possible to give such labels as slight schizophrenia,

syphilis of the central nervous system, and psychoses with a traumatic, epileptic or toxic basis.

In addition to these psychoses, which can be accounted for by a reference to some organic lesion or other, there is a quite large group which till recently has baffled definition and which would now seem quite appropriately to come under the diagnosis of mild chronic encephalitis. Dr. Erik Rydén, who is attached to Professor Sjöbring's clinic, has undertaken a special study of this condition, which he has found so common that some fifty cases of it can be recognized as such every year at this clinic. Though the basis is organic, the psychic symptoms are so dominating that it is little wonder that these patients often are sent to a psychiatric hospital. The patient often refers the onset of his troubles to some infectious disease such as influenza or measles, since which he has never been quite well. Diseases due to some virus or other would seem to be particularly important as etiologic factors. How far epidemic encephalitis is to blame is not yet clear. As for the symptoms, they are remarkably similar to those of the menopause, although every age and both sexes are represented. While prolonged rest in bed is probably the best treatment, at any rate early in the disease, the mistake is often made in prescribing more heroic measures, such as artificial fever, on the assumption that schizophrenia is to blame. Indeed, much of the importance attaching to the identification of these cases concerns their treatment; the patient needs rest and quiet surroundings, not the radical procedures now in vogue for schizophrenia or the studied neglect apt to be meted out to the subjects of more or less purely functional disturbances of the central nervous system.

What Is General Medical Practice?

There has been much discussion concerning the medical curriculum and the need for modifying it to meet the requirements of medical practice. From which end of the line are reforms to come? From the teachers? From the general practitioners who have grown old at their work and who, in retrospective mood, can tell both the teachers and their pupils what is needed most? With regard to this last question Dr. Hjalmar Sjövall, of Lund, has some pertinent facts to relate. He has undertaken a comprehensive study of the clinical notes and records of a colleague, a general practitioner in a town large enough to possess a hospital of its own. The records concern 1,000 consecutive cases seen in the course of some eight months of general practice. It should be noted that this figure refers to cases, not patients. In other words, one and the same patient with a fracture on one occasion and pneumonia on another would appear on the records as two cases. It was hoped that by means of an analysis of these records, of what was done for each case, to gain an insight into the duties and activities of a Swedish general practitioner at the present time.

What a mixture such a survey presents! In about 13 per cent of all his cases, the doctor found it necessary to send his patients to a hospital or to some specialist. A classification of the ailments brought to light the fact that as many as 200 were cases of cold in the head, sore throat, cough, hoarseness, or pain in the back or in the whole body, with or without fever. This figure could be brought up to 231 under the heading diseases of the respiratory system. As many as fifty cases were labeled neuroses and ten psychoses. Altogether there were 160 cases which could be classified as nervous disturbances. Again, there were as many as 132 cases of disease of the digestive tract. Dr. Sjövall's conclusion from this study is that one of the most important functions of the general practitioner is to sort out from a huge mass of trivial cases the very few requiring early diagnosis with the skilled treatment which alone can be expected to restore the patient to health. With highly skilled treatment in the hands of specialists, what is wanted of the general practitioner is above all diagnostic skill.

FINLAND

(From a Special Correspondent)

Feb. 15, 1940.

Medical Aspects of the War in Finland

In spite of the censorship it is now possible to glean and pass on a good deal of information concerning happenings of special interest to the medical profession. One reason why the medical services have worked with remarkable efficiency is the experience gained less than a score of years ago in Finland's war of liberation. It was, in a certain sense, a rehearsal for the present war. The fighting in 1918 was a mere skirmish compared with the pitched battles of today, but all the same the systems and standards created then have made their indelible impression on the medical services in the present war. It may not be generally known that Field Marshal Mannerheim is not only in supreme command of the army in spite of being well over 70 but is also the president of Finland's National Red Cross Society.

Foreign Medical Aid

Finland has been deeply stirred by the way in which aid of almost every kind has poured into the country from abroad. Acting on the principle that he gives twice who gives quickly, the American Red Cross cabled \$16,000 during the first week of December to London for the purchase by the British Red Cross of medical supplies and anesthetics for Finland. These were immediately dispatched by air to the Finnish Red Cross, reaching Helsinki within a few hours. In their different ways, other organizations and countries have given material expression to their sympathy with the Finns. The Spanish Red Cross has sent funds for the purchase of medical supplies and for the equipment of an ambulance unit. The French Red Cross has sent motor ambulances with personnel, and Belgium, the Netherlands, Switzerland and Hungary have all made generous contributions to the common cause.

With the Foreign Ambulances

Being such close neighbors, it was natural that Sweden, Norway and Denmark should be among the first to send well equipped ambulance units to Finland. Such ambulance work is supposed to be a young man's job, so exacting are the calls on the energies of the persons concerned. But the heads of the Red Cross ambulance units from Sweden, Norway and Denmark are veterans—Prof. Gunnar Nyström and Professor Key from Sweden, Prof. Johan Holst from Norway and Professor Chievitz from Denmark. The work of these units will, however, be eased to a certain extent by a relay system, one team of surgeons and nurses being replaced by another after a certain interval. These foreign ambulance units take their orders from the Finnish high command on entering the country, and they are distributed and quartered as the Finnish authorities think fit. But these units are in matters of internal administration more or less autonomous. The larger units are usually given quarters in some important center with good road and rail communications, and from this main body the unit detaches a mobile section which establishes itself nearer the front, constituting itself an emergency hospital in a parsonage or some other comparatively spacious building.

The Swedish Ambulance Services

The first Swedish ambulance service reached Finland on the morning of December 22 by sea, Professor von Törne greeting it at Aabo on behalf of the Finnish Red Cross. It proceeded thence by rail to Helsinki and is now established "somewhere in Finland." The school building taken over by this unit is provided with 150 beds. While the first unit had a staff of only forty, the second unit has a staff of 127, including twenty-one doctors. This second unit will be able to deal with 250 bed cases at a time. Some of its vehicles are of a new type,

designed by a civil engineer, Harald Ekman, who is in charge of the technical section of the Stockholm fire department. Both units have their own kitchens on wheels, and their equipment is such that they can still carry on even if food supplies from without run short and the electric current is cut off. Provision has also been made for lack of housing accommodation, the units having brought their own tents and huts equipped with their own heating apparatus and the outfit of a primitive operating room. Such independence of extraneous aid is most necessary in a war dominated in the air by bombers only too apt to be color-blind at the sight of a red cross, be its color ever so vivid, or its dimensions ever so large.

The Nature of the Casualties

So far this has been a war of high explosive and incendiary bombs, not a gas war. Doubtless meteorologic considerations rather than any tenderness of conscience in a humanitarian sense have relegated gas to the background, and for this immunity there is every reason to rejoice. But high explosives are bad enough, as shown by the report of Prof. Johan Holst, who has been at work near the front for several weeks and whose experience of war surgery in Finland's war of liberation and at the western front with the German forces in the war of 1914-1918 gives him a perspective in his observations of the present war. He reports that the wounds he has dealt with have on the whole been unusually severe, and he has found that just on this account the consumption of surgical dressings has been seven or eight times greater than in a civilian hospital of the same dimensions in time of peace. Another factor with a profound influence on the character of many of the casualties is the low temperature at this time of the year. Indeed, many of the casualties are exclusively due to prolonged exposure to severe cold. On the southern front the war during the first two months has been of a stationary character, with the Finns, at any rate, well entrenched. But on the eastern and northern fronts the opposing forces have surged backward and forward over wide areas sparsely populated—conditions profoundly altering the circumstances under which wounds are inflicted and treated.

A Tower of Babel

In time of peace, Finland is a bilingual country, Finnish being spoken by the masses, Swedish by the classes. The Danish and Norwegian doctors and nurses understand the Swedish spoken by the Finns and so are at an advantage compared with the ambulance units coming from other countries. The Swedish ambulance units have taken the precaution to include in their personnel people who speak both Finnish and Russian. But even so, the language difficulty is a serious problem.

SWITZERLAND

(From Our Regular Correspondent)

Feb. 2, 1940.

Antivivisection Defeated in Basel

In Basel a campaign against vivisection recently came to a close. The antivivisectionists had forced a vote by submitting the necessary 10,000 signatures required for the popular initiative. The campaign created great excitement in Switzerland and beyond its borders. The representative of the government of Basel, which has jurisdiction over educational and university affairs, pointed out that experimentation on animals was a scientific necessity, since the efficacy of new pharmaceutical remedies could not be tried out at once on human beings. The agitation of the antivivisectionists had a special significance for Basel with its highly developed pharmaceutical industry. The acceptance of the popular initiative would have necessitated removal of at least a part of this industry. The action of the council in rejecting it (ninety-seven to one) pointed the way to its defeat at the polls. Since the opponents of vivisection

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had smuggled into their bill other measures, scientific experimentation such as injections would have been killed if it had been adopted.

The defeat of the popular initiative proposal had been preceded in Basel by an intensive medical campaign to educate the public and clarify popular misconceptions. The *Schweizerische medizinische Wochenschrift* had issued a special number in which vivisection was discussed from the points of view of physiology, pharmacology, hygiene, psychology and clinical and veterinary practice. The fight against the antivivisectionists was conducted with great skill and veered from the defensive to the offensive by exposing the weaknesses inherent in the arguments of the proponents and the inconsistencies in their attitude. The indispensability of the technic of scientific experimentation on animals was vigorously maintained.

It was pointed out that what the vivisectionists charged might have occurred formerly and might still be found sporadically but did not exist in Switzerland either at Swiss university institutes or in the laboratories of the pharmaceutical laboratories. Besides, since 1934 an agreement between the assembly of delegates of the German Swiss societies for the protection of animals and the Swiss society of medical biology had formulated principles of control. This had been concealed by the militant antivivisectionists. According to these principles, accepted by both organizations, animal experimentation could be performed only if absolutely necessary and was confined within narrow limits. Experiments were to be performed as much as possible on the lower animals first. Dogs were to be used only when other kinds of animals could not be substituted. Other mammals of the higher order were similarly protected. Narcosis was to be practiced on animals in the same way as in man. Besides, animal experiments could be carried out only in institutes under responsible scientific management and subject to state control. They were permitted for purposes of classroom instruction only if they could not adequately be replaced by other methods of demonstration. All institutes performing experiments on animals as well as the laboratories of the pharmaceutical industry, it was stressed, were governed by these principles. In consequence, "animal torture in the name of science" did not occur in Switzerland.

Hediger, of Berne, set forth, in the special issue referred to, that the opponents of vivisection had no right to pretend to be experts in matters of animal experimentation. They lacked the necessary knowledge of biology and animal psychology. Their opposition rested basically on egocentric ideas. All questions pertaining to the protection of animals and vivisection could be determined, he said, only on the basis of scientific biology. No doubt sentiment played a part in the attitude of those who opposed vivisection, rooted, perhaps, in a deep feeling of the need of animal companionship in the absence of normal human relationships.

The proposal of the antivivisectionists was rejected by a vote of 18,987 to 5,036; only half of the original petitioners voted in the affirmative, seemingly a proof of the value of medical campaigns for educating the public. The society for the protection of animals publicly opposed the popular initiative.

Obituary

Prof. Fritz de Quervain, for many years a surgeon in Berne, died at the age of 71 after a brief illness. He had studied in Berne under Theodore Kocher and with Kocher published an encyclopedia of surgery in 1902. He became director of the surgical division of the hospital in la Chaux-de-Fonds. In 1909 he was appointed professor of surgery at the University of Basel. In 1918 he succeeded Kocher at the University of Berne and as director of the surgical clinic and served there many years. Not long ago he retired. De Quervain specialized in the field of thyroid gland diseases but was conversant with nearly all fields of clinical surgery. His "Special Sur-

gical Diagnosis" appeared in 1907 and was repeatedly revised and was translated into English, French, Italian, Spanish and Russian. De Quervain was highly esteemed, an excellent teacher, an experienced clinician and a man of charming personality.

ITALY

(From Our Regular Correspondent)

Jan. 15, 1940.

Congress of Radiology

The fourth Italian Congress of Radiology was held at Turin. Professor Meldolesi discussed the physical and biologic doses in measuring energy from ultraviolet sources. In heliotherapy and phototherapy the threshold of cutaneous erythema is the unit of biologic measure in actinology. In measuring ultraviolet energy by physical doses an agreement for the proper unit has not been reached. The ionometric method cannot be applied, the photochemical methods give uncertain results and the photoelectric methods, although sensitive, are inconvenient.

Professor Stoppani discussed the absorbed and transformed doses in irradiations of high potency. Increase of voltage results in percental increase of the dose, which, however, is not proportional to the increase of tension. Increase of tension, filtration and distance improves the condition of the physical factors. It makes it possible to apply radiation to lesions located in certain spots on which the application of radiation by the common technic is difficult.

Professor Castaldi spoke on the development of knowledge of mitogenic (Gurvich) rays. Studies show that tissues of living persons may give off ultraviolet radiations which originate in the tissues during reactions of oxidation and reduction, proteolysis, glycolysis, lipolysis and some other reactions. The wavelength of the radiations varies from 1,900 to 2,500 angstroms.

Professor Gallavresi studied the curve of mitosis in irradiated tumors. He found that shortly after the irradiating is begun typical karyokinesis prevails over atypical mitosis and that both typical and atypical mitosis diminish. The diminution is followed by a transient increase of atypical mitosis and then by a progressive lowering of karyokinesis, which entirely subside when the tumors are favorably modified by the treatment.

Professor Epifanio discussed the biologic and therapeutic action of neutrons on tumors. He found that hyaline degeneration and pyknosis caused by neutrons are more intense and of greater extension than those from gamma rays and that the neutronic treatment is followed by production of stromal reactions in abundance.

Deaths

Prof. Agenore Zeri, emeritus professor of medical special pathology at the Rome University, is dead. He was a professor in Italian universities for forty-two years.

Marriages

WALTER DOUGLAS HANKINS, Johnson City, Tenn., to Miss Helen Calvert Moyler of Franklin, Va., January 27.

ALGOT ASTROM, Harrodsburg, Ky., to Miss Rena May Wolcott, South Carrollton, in Lexington, January 18.

HOWARD M. SAPIRO, West Scarboro, Maine, to Miss Edythe R. Tavel of Worcester, Mass., Oct. 22, 1939.

CHARLES HATHORN WHEELER JR. to Miss Harriet Antoinette Winslow, both of New York, January 20.

THOMAS H. KUHNERT, Bristol, Tenn., to Miss Shirley Fisher of Franklin, Va., recently.

HUGH G. BOYLE, Wilkes-Barre, Pa., to Miss Marion Quigley of Luzerne, Dec. 28, 1939.

PAUL MITCHELL GLENN to Miss Hortense McClellan, both of Cleveland, January 20.

ELMER J. TEAGARDEN, Orlando, Fla., to Mrs. Mabel Barry of Apopka, January 17.

Deaths

Baxter L. Crawford * Philadelphia; University College of Medicine, Richmond, Va., 1912; assistant professor of pathology at Jefferson Medical College of Philadelphia; member of the American Association of Pathologists and Bacteriologists and the American Society of Clinical Pathologists; served during the World War; on the staff of the Jefferson Hospital; aged 53; died, January 3, at the White Haven (Pa.) Sanatorium, of pulmonary tuberculosis.

David Daniel Swearingin * Roswell, N. M.; Fort Worth (Texas) School of Medicine, Medical Department of Fort Worth University, 1901; member of the House of Delegates of the American Medical Association in 1919; on the staff of the St. Mary's Hospital; past president of the Chaves County Medical Society; aged 72; died, January 15, of coronary thrombosis.

Leroy Elijah Belding, St. Charles, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1912; member of the Missouri State Medical Association; formerly county coroner; aged 50; on the staff of St. Joseph's Hospital, where he died, January 30, of embolism following a fracture of the leg received in a fall.

John Francis Crosby, Seneca Falls, N. Y.; University of Vermont College of Medicine, Burlington, 1883; member of the Medical Society of the State of New York; past president of the Seneca County Medical Society; formerly member of the state legislature and mayor of Seneca Falls; aged 81; died, January 2, of chronic arthritis.

Charles Joseph Kane, Paterson, N. J.; Columbia University College of Physicians and Surgeons, New York, 1899; member of the Medical Society of New Jersey; fellow of the American College of Surgeons; aged 66; on the staff of St. Joseph's Hospital, where he died, January 16, of laryngeal edema, arteriosclerosis and chronic arthritis.

Larkin Hamilton Jennings, Columbia, S. C.; Medical College of the State of South Carolina, Charleston, 1900; past president and secretary of the Lee County Medical Society; at one time mayor of Bishopville; for many years member of the board of trustees of his alma mater; aged 66; died, January 28, in the Providence Hospital.

Elmer Jefferson Bissell, Santa Barbara, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1883; fellow of the American College of Surgeons; member of the board of directors from 1926 to 1936 and president of the board from 1927 to 1931, Santa Barbara Cottage Hospital; aged 78; died, January 4.

W. Levell Draper, Niagara Falls, N. Y.; Hahnemann Medical College and Hospital, Chicago, 1890; University of Buffalo School of Medicine, 1899; formerly mayor; for many years county coroner; on the staff of the Mount St. Mary's Hospital; aged 74; died, January 26, of a fracture received in a fall, and arteriosclerosis.

Charles Herbert Borden, Summit, N. J.; Columbia University College of Physicians and Surgeons, New York, 1896; at one time health officer of Stamford, Conn.; aged 66; died, January 27, in the James M. Jackson Memorial Hospital, Miami, Fla., of injuries received when he was struck by an automobile.

James Allen Clevenger, Garrett, Ind.; University of Nashville (Tenn.) Medical Department, 1888; member of the Indiana State Medical Association; at one time mayor and secretary of the board of health; secretary of the school board; aged 79; died, January 28, in Fort Lauderdale, Fla., of coronary occlusion.

Arthur Ginnever, New York; New York Homeopathic Medical College and Hospital, New York, 1901; member of the Medical Society of the State of New York; aged 74; died, January 28, in the Northampton-Accomac Memorial Hospital, Nassawadox, Va., of injuries received in an automobile accident.

C. Fred Webner * Newark, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; on the staff of the Hospital of St. Barnabas and for Women and Children and the Newark Eye and Ear Infirmary; aged 71; died, January 28, of coronary occlusion.

Hugh Lawson Peters, Knoxville, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1911; member of the Tennessee State Medical Association; served during the World War; on the staffs of the Knoxville General and Fort Sanders Hospitals; aged 55; died, January 28, in St. Mary's Hospital.

Lowry W. Page * Buckhannon, W. Va.; Eclectic Medical Institute, Cincinnati, 1909; past president of the Upshur County Medical Society; formerly county health officer and member of

the county board of education; on the staff of St. Joseph's Hospital; aged 67; died, January 12, of carcinoma of the colon.

Leon Clemmer, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1912; professor of obstetrics at his alma mater; fellow of the American College of Surgeons; served during the World War; obstetrician to the Hahnemann Hospital; aged 51; died, January 8, of chronic myocarditis.

David Sylvester Conley, Streator, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883; member of the Illinois State Medical Society; at one time president of the city board of health; aged 79; died, January 24, of chronic interstitial nephritis.

P. Clinton Pumyea * New York; Columbia University College of Physicians and Surgeons, New York, 1905; on the staff of the Welfare Hospital; formerly on the staff of the Central and Neurological Hospital; aged 59; died, January 18, of coronary thrombosis.

Robert Clayton Buck, St. Johns, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899; served during the World War; formerly surgeon in the U. S. Public Health Service reserve; aged 66; died, January 26, of cirrhosis of the liver.

Albert Frederick Kaeser * Highland, Ill.; University of Illinois College of Medicine, Chicago, 1901; served during the World War; at one time bank president; on the staff of St. Joseph's Hospital; aged 61; died, January 28, in the Barnes Hospital, St. Louis.

Samuel C. Trippe, Royal Oak, Md.; University of Maryland School of Medicine, Baltimore, 1875; member of the Medical and Chirurgical Faculty of Maryland; aged 90; died, January 24, in the Emergency Hospital, Easton, of a hip fracture received in a fall.

Arthur Franklin Stotts * Galesburg, Ill.; Medico-Chirurgical College of Philadelphia, 1899; fellow of the American College of Surgeons; served during the World War; on the staff of the Galesburg Cottage Hospital; aged 64; died, January 9, of angina pectoris.

William Denney Hoffecker, New Canaan, Conn.; Hahnemann Medical College and Hospital of Philadelphia, 1908; aged 56; on the staff of the Norwalk (Conn.) General Hospital, where he died, January 1, of pulmonary embolism following prostatectomy.

Hugh Arthur Barbee * Point Pleasant, W. Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; past president of the Mason County Medical Society; aged 65; died, January 29, in the Holzer Hospital, Gallipolis, of meningitis.

Arthur Rhodes Bradbury, Grand Island, N. Y.; University of Buffalo School of Medicine, 1892; member of the Medical Society of the State of New York; for many years health officer; aged 70; died, January 12, of injuries received in an automobile accident.

Roy Andrew Dodge * Omaha; Medical Department of Omaha University, 1901; at one time secretary of the Omaha-Douglas County Medical Society; on the staff of the Douglas County Hospital; aged 62; died, January 19, of cirrhosis of the liver.

Edmund Charles Boddy, Oil City, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; served during the World War; resident physician to the Grand View Institution; aged 65; died, January 12, of heart disease.

Charles Rasmi Christenson * Starbuck, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1896; on the staff of the Minnewaska Hospital; aged 72; died, January 14, in the Morris (Minn.) Hospital of gastric ulcer.

Edward Louis Burns, Newark, N. J.; Harvard Medical School, Boston, 1890; member of the Medical Society of New Jersey; aged 74; on the staff of St. James Hospital, where he died, January 29, of arteriosclerosis and right hemiplegia.

Robert Bruce Armstrong * Charlevoix, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1894; at one time mayor; on the staff of the Charlevoix Hospital; aged 73; died, January 30, of coronary occlusion.

James Moreau Brown * Jersey City, N. J.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; aged 62; died, January 30, in the Medical Center of Jersey City of lobar pneumonia.

John Leroy Fisher, Owego, N. Y.; Jefferson Medical College of Philadelphia, 1894; member of the Rhode Island Medical Society; served during the Spanish-American and World wars; aged 76; died, January 27, of chronic myocarditis.

Ernest Anthony Everett, O'Fallon, Ill.; St. Louis University School of Medicine, 1906; member of the Illinois State Medical Society; aged 56; died, January 19, in St. Elizabeth's Hospital, Belleville, of coronary thrombosis.

Robert Dewar MacKenzie ♂ Detroit; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1914; served during the World War; aged 48; died, January 28, of injuries received in an automobile accident.

Rupert Clyde Priest, Rusk, Texas; Southwestern University Medical College, Dallas, 1910; member of the State Medical Association of Texas; aged 59; died, January 23, in a hospital at Jacksonville of cardiorenal disease.

John Turner Kendall, Argos, Ind.; Hospital Medical College of Evansville, Ind., 1885; Rush Medical College, Chicago, 1886; aged 75; died, January 30, in the Parkview Hospital, Plymouth, of intestinal obstruction.

Frederick William Stoermann, Kansas City, Mo.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1894; aged 75; died, January 14, in the Research Hospital of pulmonary infarction.

George Francis McIntire ♂ West Barrington, R. I.; Harvard Medical School, Boston, 1908; member of the Massachusetts Medical Society; aged 68; died, January 9, in the Jane Brown Memorial Hospital, Providence.

Guy Ransom Fromm ♂ Cincinnati; Eclectic Medical College, Cincinnati, 1916; on the staff of the Booth Memorial Hospital, Covington, Ky., and the Deaconess Hospital; aged 54; died, January 31, of carcinoma.

Hiram Ferdinand Datesman, Passaic, N. J.; New York Homeopathic Medical College and Hospital, New York, 1899; for many years on the staff of St. Mary's Hospital; aged 88; died, January 31, of senility.

Archie Kelly Higgs, Portland, Ore.; Arkansas Industrial University Medical Department, Little Rock, 1891; state senator; served during the World War; aged 68; died, January 19, of coronary occlusion.

George Merriman Burrall, Los Angeles; University of California Medical Department, San Francisco, 1923; member of the California Medical Association; aged 42; died, January 14, of cirrhosis of the liver.

John Anderson, Cleveland; Niagara University Medical Department, Cleveland, 1895; on the staff of the Polyclinic Hospital; aged 78; died, January 23, of arteriosclerotic heart disease and bronchopneumonia.

Adolph Widder, Cleveland; Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest, Hungary, 1896; served during the World War; aged 65; died, January 20, of coronary thrombosis.

Robert B. Campbell, Franklin, Neb.; Keokuk (Iowa) Medical College, 1894; member of the Nebraska State Medical Association; aged 69; died, January 22, of arthritis, endocarditis and arteriosclerosis.

Alton Lawrence Sherman ♂ Orange, N. J.; Yale University School of Medicine, New Haven, Conn., 1914; on the staff of St. Mary's Hospital; aged 50; died, January 9, of coronary thrombosis.

George Alvin Holland ♂ Newark, N. J.; University of Vermont College of Medicine, Burlington, 1930; on the staff of the Beth Israel Hospital; aged 39; died, January 4, of acute coronary occlusion.

Henry B. Downs, Danville, Ill.; St. Louis College of Physicians and Surgeons, 1898; formerly a minister and lawyer; aged 80; died, January 21, in the Lake View Hospital of chronic myocarditis.

William Nathaniel Hankins, Shreveport, La.; University of Tennessee College of Medicine, Memphis, 1915; served during the World War; aged 49; died, January 30, of ventricular fibrillation.

Chauncey C. Hacker, Elizabethton, Tenn.; College of Physicians and Surgeons, Baltimore, 1907; formerly mayor; aged 63; died, January 14, of coronary thrombosis and arteriosclerosis.

Lee M. Clarke, Pelahatchee, Miss.; University of Tennessee Medical Department, Nashville, 1891; aged 74; died, January 8, of multiple sclerosis and bronchopneumonia.

Harriet Agnes Williams Baker, Pittsfield, Mass.; Boston University School of Medicine, 1903; aged 61; died, January 7, in Boston, of carcinoma of the stomach.

Henry Charles Kehoe, Fort Myers, Fla.; Pulte Medical College, Cincinnati, 1885; aged 82; died, January 1, in Shelbyville, Ky., of cerebral hemorrhage.

Jonathan Howard McCaleb, New Orleans; College of Physicians and Surgeons, Baltimore, 1881; aged 84; died, January 7, in the Touro Infirmary.

Francis Eugene Prestley, Mexico, D. F., Mexico; Rush Medical College, Chicago, 1893; aged 68; died, January 23, of pneumonia following an operation.

Charles Raymond Farnham, Milwaukee; Milwaukee Medical College, 1904; aged 60; died, Dec. 9, 1939, of coronary sclerosis and chronic myocarditis.

Clara C. Sterling, Chicago; Hering Medical College, Chicago, 1907; aged 71; died, January 4, in the Middle Georgia Hospital, Macon, of myocarditis.

John Ellsworth Holland, Mount Pleasant, Iowa; Bellevue Hospital Medical College, New York, 1890; aged 77; died in December 1939 of heart disease.

Benjamin Harvey Hill Ward, Atlanta, Ga.; Atlanta School of Medicine, 1908; aged 55; died, January 22, of heart disease and chronic nephritis.

Mert Hawkins Starnes, Lubbock, Texas; University of Texas School of Medicine, Galveston, 1916; aged 50; died, January 20, of pneumonia.

Frank D. Kelly, Olanta, S. C.; Medical College of the State of South Carolina, Charleston, 1911; aged 52; died, January 7, in a hospital at Florence.

Walter W. Bruce, Portland, Ore.; Willamette University Medical Department, Salem, 1902; aged 60; died, January 9, of coronary thrombosis.

Donald Stevens Adams ♂ Los Angeles, Calif.; Harvard Medical School, Boston, 1933; aged 34; died, Dec. 4, 1939, of chronic myocarditis.

Charles T. Black, El Dorado, Ark.; Memphis (Tenn.) Hospital Medical College, 1906; aged 57; died, January 26, of chronic myocarditis.

Karl Campbell Prichard ♂ Huntington, W. Va.; Jefferson Medical College of Philadelphia, 1906; aged 60; died, January 5, of pneumonia.

Newton Cook, Sandy Creek, N. Y.; University of the City of New York Medical Department, 1879; aged 85; died, January 7, of pneumonia.

William Albion Dulaney, Wayne City, Ill.; St. Louis University School of Medicine, 1905; aged 66; died, January 21, of myocarditis.

Milo A. Schultz ♂ Memphis, Tenn.; Memphis Hospital Medical College, 1902; aged 63; died, January 18, of chronic myocarditis.

James B. Dunham, Wenona, Ill.; Hahnemann Medical College and Hospital, Chicago, 1881; aged 85; died, January 10, of myocarditis.

Guy Wimberly ♂ Ringgold, La.; Memphis (Tenn.) Hospital Medical College, 1908; aged 57; died, January 16, of chronic myocarditis.

Oscar Clarence McCarn, Warrior, Ala.; Birmingham Medical College, 1907; aged 62; died, January 15, of coronary thrombosis.

Mark Alva Nye, Omaha; University of Nebraska College of Medicine, Omaha, 1904; aged 67; died, January 21, of coronary occlusion.

Charles E. Howard, Benton, Ky.; University of Louisville Medical Department, 1892; aged 74; died, January 23, of myocarditis.

Charles R. Sheckler, Brokensword, Ohio; Columbus Medical College, 1878; aged 83; died, January 7, of arteriosclerosis.

Clarence H. Adye, Newtonville, Ind.; Louisville (Ky.) Medical College, 1894; aged 69; died, January 13, of myocarditis.

John Pedden, Grand Rapids, Mich.; Detroit College of Medicine, 1900; aged 67; died, January 18, of bronchopneumonia.

Franklin J. Patchin, El Paso, Texas; Columbus Medical College, 1881; aged 87; died, January 1, of chronic nephrosis.

Frank Oliver Wood, Hope, Ark. (licensed in Arkansas in 1903); aged 77; died, January 12, of cardiorenal disease.

William P. Leonard ♂ Talbotton, Ga.; Atlanta College of Physicians and Surgeons, 1900; aged 63; died, January 20.

Eli Trimble, Seymour, Mo.; Louisville (Ky.) Medical College, 1896; aged 73; died, January 5, of diabetes mellitus.

William A. Wilson, Gahanna, Ohio; Columbus Medical College, 1878; aged 85; died, January 22, of carcinoma.

Mike Hodge Pearce, Elko, Ga.; Atlanta Medical College, 1914; aged 56; died, January 20, in Hawkinsville.

Correspondence

COMPULSORY SICKNESS INSURANCE

To the Editor:—The industrial picture in Britain has lately been holding my attention because it is the nation whose experience with compulsory health insurance that has been presented as most worthy of being copied.

Prior to the rearmament activity, Britain's unemployed were listed as approximating 2,000,000. In spite of the war's effect on employment it is said to have been 100,000 more in December 1939 than in the preceding September.

Up to the time of the initiation of rearmament the recipients of the dole were estimated to be in the neighborhood of from 16 to 18 million. How are the figures relative to the unemployed to be correlated with those on the dole?

Half of Britain's working population receives less than £250 (\$1,250) annually. These and their dependents—again, a matter of 18 million—are the beneficiaries of her National Health Insurance. What relation have their numbers to the unemployed or to those on the dole? If the figures for those on the dole do not represent the same fraction of the population as the employed group with incomes less than £250, how, then, are their health needs met? Are they the "charity" of the profession or, if not, in what manner do they provide or is compensation provided for the physician?

Physicians in Britain receive 9 shillings (\$2.25) per capita annually. Yet it is proposed in California, among one fifth as many beneficiaries, for one half as many physicians to give the latter more than two times as much as is allotted to their colleagues in Britain under an identical taxation scheme.

JOHN F. QUINLAN, M.D., San Francisco.

"GERIATRICS"

To the Editor:—Permit me to correct an error in Dr. Tuohy's article on geriatrics in your issue of January 20. He said "Masters introduced it (the word 'geriatrics') in a thesis in 1914." I coined the word "geriatrics" and suggested it to cover a special branch of medicine dealing with old age, in a paper which appeared in the *New York Medical Journal* Aug. 21, 1909, lectured on Geriatrics in Medical Schools in Chicago, New York and Boston from 1909 to 1916, organized the New York Geriatric Society in 1912, and Blakiston published the first edition of my textbook "Geriatrics, Diseases of Old Age and Their Treatment" in 1914. Official duties prevented the continuance of my work in geriatrics. Now, retired and well along in years (76), I still take an active interest in the subject and hope to see it become a major branch of medicine.

I. L. NASCHER, M.D., Port Richmond, N. Y.

TREATMENT OF WAR FRACTURES BY THE CLOSED METHOD

To the Editor:—In THE JOURNAL, February 10, in the London letter there appears under the caption "Treatment of War Fractures by the Closed Method" a discussion of a report by Dr. Trueta before the Royal Society of Medicine. In this report is described a method of treating compound fractures which one would gather is supposed to be something new. According to the London letter, in the discussion "the president of the section of surgery, Mr. Cope, described it as momentous and bidding fair to revolutionize a most difficult war problem."

The mechanical disinfection-closed plaster cast treatment of compound injuries has been well known and widely used in this country since its description by H. Winnett Orr, of Lincoln, Neb., and since the publication of Orr's book (*Osteomye-*

litis and Compound Fractures, St. Louis, C. V. Mosby Company, 1929) it has been adequately described in a number of places (Bickham, W. S., and Smyth, C. M., Jr.: *Operative Surgery*, Philadelphia, W. B. Saunders Company, 1933, vol. 7; Warbasse, J. P., and Smyth, C. M., Jr.: *Surgical Treatment*, Philadelphia, W. B. Saunders Company, 1937, and in a number of papers by Damon B. Pfeiffer and myself). It would seem, therefore, that the so-called revolutionizing of this problem has been somewhat delayed in other parts of the world. Is it possible that this is another illustration of that well known British frugality in giving credit to anything originating in America?

CALVIN M. SMYTH JR., M.D., Philadelphia.

"SAFE TRANSPORT FOR THE UNCONSCIOUS PATIENT"

To the Editor:—I read Dr. Flagg's communication on "Safe Transport for the Unconscious Patient" in THE JOURNAL, February 17, with great interest because only last week I encountered a very similar case.

At 5 p. m. on February 14 I was called to see a married woman aged 28 who was sinking rapidly. Forty hours previously she presented symptoms and signs plus spinal fluid changes of a subarachnoid hemorrhage, and since that time she had been semiconscious, rousing at intervals. When I arrived at the home her husband was applying artificial respiration, there being no voluntary effort; her radial pulse was barely felt at 120 and her heart sounds were feeble. A lumbar puncture was immediately done and circulatory stimulants were given. An ambulance was called and arrangements were made to place the patient in a Drinker respirator in a Syracuse hospital. The ambulance arrived at 8:15 and the patient was placed in it and, escorted by state police, carried a distance of 35 miles through a blinding snowstorm to the hospital, which was reached at 10:45. All this time artificial respiration was being maintained by four persons taking turns in the ambulance. The patient was immediately placed in the respirator after being placed on a hospital stretcher and taken upstairs in an elevator; she survived for three hours in it. Autopsy confirmed the diagnosis, there being a rent in an aneurysm of the right middle cerebral artery on the ventral surface of the brain.

This case strengthens Dr. Flagg's statement that "the feasibility of transporting safely the patient who has ceased to breathe" really exists.

MARVIN BROWN, M.D., Cleveland, N. Y.

HYPOPARATHYROIDISM

To the Editor:—A scientific fact is unaltered by the question of its parenthood, but for the sake of historical accuracy we wish to call your attention to what appears to us to be an accidental oversight by two of your contributors. Drs. C. L. Spingarn and S. H. Geist in THE JOURNAL of Dec. 30, 1939, gave an able discussion of the effect of hyperparathyroidism in the mother on the developing embryo. They state that Bakwin (Tetany in Newborn Infants, *J. Pediat.* 14:1 [Jan.] 1939) called attention to the existence of hypoparathyroidism in the newborn. Permit us to say that three years before the appearance of Bakwin's publication we established by means of chemical and metabolic studies the existence of hypoparathyroidism in a 7 weeks old infant (Infantile Tetany, *Am. J. Dis. Child.* 51:816 [April] 1936). We wish to repeat that, while the question of priority may not be important, the added evidence which we presented to favor the thesis of Drs. Spingarn and Geist is of sufficient importance to merit your attention.

JOSEPH B. PINCUS, M.D.
ISAAC F. GITTLERMAN, M.D.

Broadlynn.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HODGKIN'S DISEASE AND SULFANILAMIDE

To the Editor:—I should like to ask several questions relevant to the position, if any, of sulfanilamide in the theory and therapeutics of Hodgkin's disease. I am prompted to make this inquiry by the unexpected results of the more or less unintentional use of the compound in an early case. About eighteen months ago I was consulted by a man aged 25 who gave the following history: Three months previously he had undergone the extraction of six badly infected teeth at one sitting. A few weeks later he noticed a tender lump beneath the angle of his jaw. Other lumps appeared until the cervical chain and gradually the axillary glands were enlarged, slightly painful and moderately tender to pressure. When I saw the patient, the involvement had become bilateral. The blood picture showed a moderate anemia and a slight leukocytosis (10,000), with no significant abnormalities except the presence of 4 per cent eosinophils. I removed a gland for pathologic study and, pending the arrival of the report, administered sulfanilamide in doses of from 3 to 4 Gm. daily. This was done on the concededly slim chance that, in the presence of pain and tenderness and the absence of pruritus, the adenopathy might be related to the oral sepsis described. The results were startling: the pain and tenderness, which had been present without remission since the onset, disappeared in forty-eight hours, and in the course of a week all the glands had become appreciably smaller and softer, a few becoming actually impalpable. The pathologic report, which became available at this time, described eosinophils, Dorothy Reed cells, polymorphonuclears and fibrosis, corresponding to what Jackson has since labeled the "granuloma type." The diagnosis, made by a qualified pathologist, was subsequently confirmed. Sulfanilamide therapy was discontinued immediately and the patient referred for roentgen therapy. The response to x-rays was good, and two subsequent recurrences have also responded well to irradiation. My questions are the following: Are the remissions in Hodgkin's disease frequently so dramatic that the one described may have been a coincidence, unrelated to the treatment? In the matter of the etiology of Hodgkin's disease have the theories of an infectious origin and a neoplastic response to infection gained any ground within recent years? In any case is there sufficient evidence in these directions to justify the use of sulfanilamide and related compounds, at least as an adjunct therapy, or perhaps in the intervals between courses of irradiation? If so, which of the several compounds would appear to be most suitable?

P. B. Candela, M.D., Brooklyn.

ANSWER.—The best general answer to this question is to quote from a statement made by Dr. E. B. Krumbhaar in September 1939: "Thus we see that the problems of Hodgkin's disease of the past generation remain the problems of today. We still do not know whether it is an infectious granuloma or a neoplasm, and therefore we are ignorant of its pathogenesis (its portals of entry, if any, and how it develops); we have no specific laboratory diagnostic test other than the biopsy examination; we have no means of predicting how long a given case will survive; and we have no specific form of treatment."

Remission without treatment in Hodgkin's disease is exceedingly uncommon, although progress is sometime slow. The one false note in this account is the painful and tender glands. The glands in Hodgkin's disease are usually painless and produce discomfort only by pressure on surrounding structures. No authentic report of the beneficent effect of sulfanilamide in this condition has appeared in the literature.

VISUAL SCREENING TESTS AND VISION CHARTS

To the Editor:—As a member of the board of education and president of the board of health, I have been approached by the school nurses to settle a controversy. At the National Convention of Optometrists the teachers were invited in to hear a tirade condemning the use of Snellen charts for the determination of visual acuity of school children and demanding that they use the Betts telebinocular machine. The February issue of *Hygeia* answers a question on the subject and says that a committee of the American Medical Association would soon have a report to render on the subject of the Betts telebinocular machine. Can you enlighten me by such a report? Would the routine duties of a school nurse require her to use this machine to check children's eyes on demand from the teaching organization? Is a school nurse supposed to make any diagnostic report or decision relative to a pupil's eyes? Is a teaching organization supposed to propagandize the use or sale of any optical equipment? Any help that you can give me on this subject will be doubly appreciated, in view of the fact that I am an ophthalmologist and still use Snellen charts in my own office.

M. P. Andrews, M.D., Manitowoc, Wis.

ANSWER.—The report referred to was made by the Council on Physical Therapy and was published in *THE JOURNAL* Sept. 2, 1939, page 937. The report announced that the Betts charts, which are used on the telebinocular, a form of stereoscope,

were not acceptable to the Council. This decision was made because of the experience of members of the committee that examinations with the Betts charts greatly overestimate the number of children in whom eye defects are a cause of reading disability. This opinion was supported by an investigation by Oak and Sloane, reported in the *Archives of Ophthalmology* for November 1939. The latter found that only three of 100 children were able to pass the Betts tests when repeated at two successive examinations, following the technic described in the manual. When the charts were used by another method of scoring suggested by a Keystone expert, the number of children checked as defective was still much greater than when the same children were tested by a regular ophthalmologic examination. It is true that the Snellen test reports defects only in central vision and neglects several other factors.

A series of simple tests has been arranged by Dr. Walter Lancaster and is being tried in the Boston schools and some other schools at present. These tests appear to offer advantages over both the Betts charts and the Snellen charts. The tests are made so that they can be carried out by a school nurse after a short training in their use. In most schools the school nurse is not required to make any diagnostic report but only to report that the child is or is not in need of further examination of the eyes by a specialist.

If a teaching organization demanded that a school nurse use a Betts apparatus to make a visual screening survey of the children under her charge, the nurse should refer the matter to a competent ophthalmologist, who should make it his business to set the teaching organization right about a question on which the organization lacks technical knowledge.

A school nurse is supposed to report such visual defects as her limited knowledge permits her to detect. Diagnoses and therapeutic measures lie entirely beyond the scope of her duties or capabilities. Certainly no teaching organization should propagandize the use or sale of optical equipment.

SULFANILAMIDE PROPHYLACTICALLY FOR MENINGOCOCCIC MENINGITIS

To the Editor:—Kindly advise the dosage of sulfanilamide which might be given prophylactically to children and adults exposed to epidemic cerebrospinal meningitis.

F. J. Blasingame, M.D., Wharton, Texas.

ANSWER.—Little information is available concerning the prophylactic use of sulfanilamide in infections which are susceptible to therapy with this drug. There is no published information available regarding the efficacy of the drug in the prevention of meningococcic meningitis. Unpublished reports seem to indicate that sulfanilamide therapy will not eradicate meningococci from the throats of meningococcus carriers. It is possible therefore that the prophylactic use of the drug might not be of much value in preventing meningococcic infection. However, one cannot go entirely on such data. If the drug is to be used prophylactically against meningococcic infections such use would have to be considered entirely experimental and hence the dosage required would have to be determined by the method of trial and error.

STERILE SOLUTION OF SULFANILAMIDE—SULFANILAMIDE IN ABDOMEN

To the Editor:—How can sulfanilamide be safely used in the infected abdomen, since the chemical cannot be autoclaved?

M.D., Virginia.

ANSWER.—Sulfanilamide can be autoclaved at 15 pounds pressure for five minutes without causing decomposition of the drug if it is prepared in a 1 per cent physiologic solution of sodium chloride. However, this type of sterilization is not frequently used in preparing solutions of the drug. Generally, in preparing solutions of sulfanilamide for parenteral use a measured amount of sterile physiologic solution of sodium chloride, sixth molar sodium lactate in saline solution or lactate-Ringer (Hartmann's) solution is brought to a boil and then the flame is cut off and enough crystalline sulfanilamide is added to make a 1 per cent solution. With gentle shaking the drug readily goes into solution. The solution is cooled to 37 C. and is then ready for use. Fresh solutions of the drug should be prepared daily. These solutions should be kept at room temperature. At icebox temperatures the sulfanilamide crystallizes out of solution. In these forms it could probably be used in an infected abdomen. However, experience has shown that, in general, the oral administration of the drug or its parenteral use by the subcutaneous route is preferable to using a solution of the drug as an irrigating fluid in cases of peritonitis. Ravdin and his associates (*Ann. Surgery* 111:53 [Jan.] 1940) have recently discussed

favorable results which they have obtained by the oral use of sulfanilamide in cases of acute appendicitis. In a certain proportion of these cases a localized or generalized peritonitis was present.

DIAGNOSIS AND TREATMENT OF TULAREMIA

To the Editor:—Please discuss fully the cutaneous tests for tularemia, both the test with antigen made from a diluted suspension of *Bacterium tularensis* and the test with the diluted antitularemic serum (as described in the circular which comes with Sharp & Dohme's antitularemic serum). Please discuss also the time of reading the tests, their degree of accuracy (both positive and negative reactions), and how soon after the onset of the disease they are positive. Would an agglutination reaction of patient's serum of 1:20 three years after the disease be considered evidence of tularemia in the past? What is the status at the present time of both antitularemic serum and sulfanilamide? It seems that many physicians in this vicinity are using sulfanilamide in the treatment of tularemia but I can find only one reference to its use in the Journal, and this is a report of only one case. In an abstract of an article by Elson from the *New Orleans Medical and Surgical Journal* of December 1938 appearing in *The Journal*, Jan. 21, 1939, page 274, it is stated that ferrous iodide is a specific in tularemia. Please elaborate.

M.D., Mo.

ANSWER:—Cutaneous tests with the special *Bacterium tularensis* antigen developed by Foshay, of the University of Cincinnati, should be read forty-eight hours after injections are made. The special antigen is safer than a highly diluted suspension made from formaldehyde-killed agglutinating antigen, since the latter is capable of provoking occasional serious focal and constitutional reactions as well as necrosing local reactions. Falsely positive reactions have not yet been recorded with Foshay's skin test antigen, and the test appears to be highly specific.

Cutaneous tests with diluted antitularemic serum must be controlled each time with equally diluted, strictly normal serum from the same animal species. Otherwise it is not possible to differentiate the bacterial-specific reaction from the serum protein-specific response. This reaction should be read immediately and at five minute intervals up to the twentieth minute. A positive reaction consists of enlargement of the central wheal to two or two and a half times its original diameter, with a surrounding areola of erythema usually at least 1 inch (2.5 cm.) in diameter, at the site of the immune serum injection, with no reaction at all at the site of the normal serum injection. Falsely positive reactions have not been recorded, and the specificity of this test appears to equal that of the cutaneous test with the bacterial antigen.

Both of these tests have given positive reactions when applied as early as eight hours after the initial chill. However, in about 7 per cent of 300 proved tularemic infections these tests were negative to initial trials in the first six days of illness (falsely negative reactions). Repetition of the tests at forty-eight hour intervals gave positive responses before serum agglutinins appeared in all persons except one. Reliability is much greater at later stages of illness.

Although the titer of 1:20 is lower than that usually found three years after illness, provided the test was performed properly and that brucellosis is not present, it may be considered that an agglutination titer of 1:20 provides evidence of previous tularemic infection.

Serum therapy has been shown to shorten morbidity and to diminish mortality to significant degrees. No accurate data are available on the use of sulfanilamide in the treatment of tularemia. Unpublished information on its use in thirty cases indicates little or no favorable action of the drug.

Since no evidence was presented to indicate that tularemic infection existed in any case mentioned in the article referred to, it is not possible from the information presented to estimate what effect syrup of ferrous iodide might have in this infection. Whenever various iodides have been administered to patients with proved tularemic infections, all students of this disease are in general agreement that there occurred no significant modifications from the natural course of the illness.

ULTRAVIOLET LAMPS

To the Editor:—Are ultraviolet lamps to be recommended for use at home for their general tonic and "sunburning" effect?

W. S. Dietrich, M.D., New Cumberland, Pa.

ANSWER:—If the object is to tan the skin and in this way obtain the sensations and perhaps the illusion that go with increased pigmentation of the skin, ultraviolet lamps can be recommended. Obtaining in this manner a general tonic effect on the body is a different matter. For many years it has been the attitude of the Council on Physical Therapy of the Ameri-

can Medical Association that ultraviolet rays generated artificially by a lamp of any kind cannot be depended on to increase the tone of tissues or of physiologic processes in general.

Exposure of the bare body to natural sunlight, especially when this is done in properly graduated periods of exposure, is often followed by an improvement in the tone and physiologic function of the skin, and indirectly of the body. However, it has never been conclusively demonstrated that this is a specific effect of the ultraviolet rays produced by the sun. There is evidence to indicate that the mere contact of the skin with the open air plays a part in these effects and it is not clear, therefore, how much of these effects are due to contact with open air and how much may be attributed to the direct action of the ultraviolet rays from sunlight.

Ultraviolet rays produced artificially by various kinds of lamps only remotely simulate the spectrum of sunlight. Such a beam of ultraviolet rays is made up chiefly of certain lines of the spectrum where the intensity is high, but at other points in the spectrum the intensity may be low or absent. It is for this and the other reasons mentioned that the Council has not allowed manufacturers of accepted ultraviolet generators to advertise that exposure to rays generated by their lamps increases the tone of tissues or of other body structures.

FLUORIDES AND MOTTLED ENAMEL

To the Editor:—In the particular locality where I am practicing the drinking water contains fluorine, 3 parts per million; this amount is definitely enough to mottle the teeth in children who drink it. The question arises, and I have been asked many times: 1. Is it necessary for a pregnant or nursing mother, in order to prevent mottling of her child's teeth, to seek water with a lesser concentration of fluorine? 2. Is it possible that fluorine ingested at that time could mottle the teeth later? 3. Would it be possible that enough fluorine could be obtained from pasteurized milk of local cows to cause mottling?

M.D., Arizona.

ANSWER:—1. It is unlikely that the use by a mother during the period of gestation and lactation of a domestic water containing 3 parts per million of fluorides will result in the mottling of her child's teeth. This statement is based on epidemiologic evidence. In endemic areas where the fluoride concentration is considerably higher than the quantity referred to, only sporadic instances of mottled enamel are observed in the deciduous teeth. A considerable portion of the calcification of the deciduous teeth occurs in utero; probably this explains their relative freedom from mottled enamel.

2. It should be borne in mind, however, that certain of the permanent teeth begin calcification of the crowns at birth or shortly thereafter. Water containing 3 parts per million of fluorides would produce mottled enamel in a high percentage of those children using it for drinking and cooking during the calcification period. For instance, the calcification of the crowns of the permanent central incisors begins between the third and fourth months of life and is completed between the fourth and fifth years. It is during this period that the toxic effects of fluorides with respect to mottled enamel are operative even though these teeth do not erupt until several years later. For the protection of all permanent teeth, third molars excepted, the fluoride content of the water used for both drinking and cooking during the first eight years of life should not exceed 1 part per million.

3. Phillips, Hart and Bohstedt (*J. Biol. Chem.* 105:123 [April] 1934) state that no difference was observed in the biologic reaction of rats fed normal milk as compared with those fed milk from cows receiving an added source of fluorine. They further note that the fluorine content of milk is comparatively difficult to influence by dietary means.

IRON IN MOLASSES, TABLE SYRUPS AND SUGARS

To the Editor:—Recently I heard over the radio a food "expert" speak about molasses containing a large amount of iron. I thought molasses was a sugar just like corn syrup. How much iron is in molasses, honey, karo syrup and dextralmaltose? Has molasses been used in infant feeding formulas? If so, with what results?

M.D., New York.

ANSWER:—Molasses as formerly manufactured was the mother liquor remaining after the removal of one crop of sugar crystals from the boiled down juice of the sugar cane. Because the removal of cane sugar by one crystallization is far from complete, the molasses thus obtained was rich in sucrose. It also contained the majority of the other constituents of the cane juice, including the ash, in relatively high proportion. It is now customary to remove the sucrose more nearly completely by a series of crystallizations. Types of molasses derived from successive crystallizations of sugar are designated as first, second and third molasses; they differ from one another in sucrose and ash content, the first molasses containing more

sucrose and less ash than the second or third. The iron content of the molasses products of one manufacturer has been determined by Harris, Mosher and Bunker (The Nutritional Availability of Iron in Molasses, *Am. J. Dig. Dis.* 6:459 [Sept.] 1939), who found a content of 3.2, 6.0 and 11.3 mg. of iron per hundred grams respectively for first, second and third molasses. Other investigators have reported an average iron content of 7.3 mg. per hundred grams, or 0.0073 per cent. The iron of molasses is reported to be in available form, although that of the third molasses appears less well utilized by rats than that of the first and second types. Molasses may be considered a rich and inexpensive source of iron in the diets of older children and adults. No reports of the use of this product in infant feeding have appeared in the scientific literature.

Most table syrups used as modifiers of milk in infant feeding are prepared from corn syrup and either sugar syrup or refiners' syrup. The corn syrup ingredient is prepared by hydrolyzing corn starch in an acid solution under steam pressure until a definite percentage of dextrose is formed. The solution is then neutralized with sodium carbonate and filtered. The filtrate is concentrated in vacuum to the desired density. Refiners' syrup is the mother liquor or residual product obtained in the process of refining substances which distinguish the brown or yellow raw cane sugar from the white refined cane sugar. According to federal definition, refiners' syrup contains not more than 25 per cent water and not more than 8 per cent ash. Sugar syrup is the product made by dissolving cane or beet to the consistency of the syrup. It contains not more than 35 per cent water. In general, the light table syrups containing corn syrup consist of a mixture of corn syrup and sugar syrup, and the dark or "golden" syrup consists of corn syrup flavored with refiners' syrup. According to Rose (Laboratory Handbook for Dietetics, ed. 4, New York, Macmillan Company, 1937), dark corn syrup contains an average of 12.8 mg. of iron per hundred grams while the light corn syrup contains about 1.4 mg.

Schuette and Remy (*J. Am. Chem. Soc.* 54:2909, 1932) have studied the iron content of honey and report that light honeys contain an average of 0.24 mg. of iron per hundred grams while dark honeys contain an average of 0.94 mg. A maximum value of 3.5 mg. was reported for dark honeys. No information concerning the iron content of dextrimaltose is available, but according to the information provided by the manufacturer and published in the book "Accepted Foods," Mead's Dextri-Maltose with Added Extract of Wheat Embryo and Yeast contains approximately 8 mg. of iron per hundred grams. Corn syrup and dextrimaltose are widely used in infant feeding, and the successful use of honey as a carbohydrate modifier for milk in infant feeding has been reported by Schlutz and Knott (*J. Pediat.* 13:465 (Oct.) 1938).

NO DANGER FROM INHALING HAIR
IN DRY SHAVING

To the Editor:—Is there any possibility of damage to the lungs from inhalation of the small particles of hair cut off by dry electric shaving?
M.D., Ohio.

ANSWER.—The diameter of human hair is too great to permit successful inhalation. Investigation of the possibilities has shown that one cannot cut segments short enough to be inhaled. After prolonged attempts the project has been given up.

LEAD AND ARSENIC IN FOODS AND
PLANT SPRAYS

To the Editor:—Will you please send me the latest information you have on the human tolerance for lead and arsenic, both as obtained from spray residue on fruits and vegetables and as found naturally occurring in foods. Can you give any information regarding the possibility of plant foods absorbing lead or arsenic from soil frequently sprayed with these minerals?
Martha Potgieter, Associate Professor of Foods and Nutrition, Honolulu, Hawaii.

ANSWER.—It is not possible to summarize in any brief way the information about the human tolerance for lead and arsenic from foods. An article by H. O. Calvery (Chronic Effects of Ingested Lead and Arsenic, *THE JOURNAL*, Nov. 5, 1938, p. 1722) summarizes much of the available information and emphasizes the lack of data regarding the significance of minute traces of lead and arsenic in ordinary foods. It is known that these elements are toxic, and contamination of foods with lead and arsenic should be avoided. The present tolerance for lead and arsenic in fruits as established by the U. S. Food and Drug Administration is 3.57 parts per million for lead (as Pb) and 1.06 parts per million for arsenic (as As). These tolerances were devised with particular reference to spray residues on foods, especially apples and pears. Action can, of course, be

brought against any foods containing excessive amounts of lead and arsenic on the ground that these metals are toxic and deleterious substances. There is an interesting exception in the case of shrimp and possibly some other sea foods, in which relatively high concentrations of arsenic are found. It has been shown that this arsenic is in harmless organic combination and is not stored by the animal body but is excreted in the urine.

It is usually considered that there is a real possibility of plant foods absorbing lead or arsenic from soil which has been sprayed with large amounts of toxic insecticides containing these elements. A discussion of the subject is provided by P. J. Hanzlik (Health Hazards of Chemo-Enemies in Contaminated Foods, *Scientific Monthly* 44:435 [May] 1937).

VITAMINS AND SKIN CANCER

To the Editor:—Have you any evidence that the topical application of vitamin A or vitamin D will accelerate the growth of cutaneous neoplasms, or tend to produce cancer on a normal skin or on a so-called precancerous skin?
Robert R. McLaughlin, M.D., New York.

ANSWER.—There is no published evidence that the topical application of vitamin A or vitamin D or both together will cause tumors in albino mice, the skin of these animals being much more sensitive than that of human beings. It is true that exposure of mice to considerable doses of ultraviolet radiation will cause the appearance of a few epitheliomas of the skin and attempts have been made by Roffo and others to connect the appearance of these tumors with alleged activities of cholesterol, which, of course, is present in the skin. The irradiation of cholesterol with ultraviolet rays causes the formation of some vitamin D. But no proof of this theory of cancer formation has been published. On the other hand, solutions in oil of vitamin A and vitamin D have been used by dermatologists to aid in the healing of chronic ulcerations, especially those connected with damage of the skin by x-rays. These physicians are in a position to note the production of malignant growths on a normal or a precancerous skin and as no such reports are forthcoming it is evident that neither of the substances mentioned will produce cancer on a normal skin or on a precancerous one. The increased growth rate of tumors which is occasionally observed after injury is due to the increased blood supply which feeds the tissues and enables more cells to grow.

FLUOROSCOPY AND THE DIAGNOSIS OF
MINIMAL TUBERCULOSIS

To the Editor:—In *Queries and Minor Notes* in *The Journal* January 13 (p. 180) I noticed the subject of fluoroscopy and the diagnosis of minimal tuberculosis. To supplement or perhaps amplify the information which you gave I would call attention to two articles (Fellows, H. H., and Ordway, W. H.: Fluoroscopy versus Physical Findings in the Detection of Pulmonary Tuberculosis, *Tr. Nat. Tuberc. Assn.*, 1937, p. 51; Control of Pulmonary Tuberculosis in an Employee Group: Possibilities and Limitations, *ibid.*, p. 211) which answer one phase of your reply having to do with the percentage of error of routine fluoroscopy as checked by roentgenograms of the chest. Also I present an abstract from our annual reports showing the percentage of new clinically significant cases picked up each year among our home office employees. It has been gratifying to detect over 75 per cent of the cases in the minimal stage during the past several years. The source of this question was also of interest to me, as one of the wholesale jobs of fluoroscopy is being carried out by Dr. Sixto A. Francisco, of Manila, who has a portable traveling fluoroscopic unit with which he has made more than 150,000 examinations. It seems to me that, until some economical and accurate method of carrying out routine case-finding studies is found, fluoroscopy fills the need. Routine roentgenograms, either on celluloid or on paper, are so expensive that, while ideal, they are unobtainable for most surveys. Certainly fluoroscopy seems to be superior to the use of physical examination and subjective symptoms in the detection of early lesions.

H. H. Fellows, M.D., New York.
Assistant Medical Director, Metropolitan Life Insurance Company.

New Cases of Clinically Significant Pulmonary Tuberculosis Discovered
Among Employees at the Home Office of the Metropolitan
Life Insurance Company

Year	Minimal	Moderately Advanced	Far Advanced
1934.....	38	8	1
1935.....	31	11	2
1936.....	21	4	0
1937.....	19	0	1
1938.....	17	6	1
1939.....		2	0
Per cent: Minimal.....	77		
Moderately advanced.....	20		
Far advanced.....	3		
Average number of employees, 13,837			

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS
SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, March 9, page 914.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: *Basic Science*. Tucson, March 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson. *Medical*. Phoenix, April 2-3. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science*. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular)*. Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison. *Medical (Eclectic)*. Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco, April 17. *Written examination*. San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: Denver, April 2-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Endorsement*. Hartford, March 26. Sec., Dr. T. P. Murdock, 147 W. Main St., Meriden.

DELAWARE: *Examination*. Dover, July 9-11. *Reciprocity*. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science*. Washington, April 22-23. *Medical*. Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: *Basic Science*. De Land, May 25. Sec., John F. Conn, De Land. *Medical*. Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, April 2. Dir., Bureau of Occupational Licenses, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, April 2-4. Acting Superintendent of Registration, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science*. Des Moines, April 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Building, Des Moines.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 5-7. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic*. Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science*. Minneapolis, April 2-3. Sec., Dr. J. Charney McKinley, University of Minnesota, 126 Millard Hall, Minneapolis. *Medical*. Minneapolis, April 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity*. Helena, April 1. *Examination*. Helena, April 2-3. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEBRASKA: *Basic Science*. Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Reciprocity with oral examination*. Carson City, May 6. Sec., Dr. Frederick M. Anderson, 215 North Carson St., Carson City.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Reciprocity*. Columbus, April 2. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Science*. Oklahoma City, May 9. *Medical*. Oklahoma City, June 5-6. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Basic Science*. Corvallis, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, April 4-5. Sec., Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: San Antonio, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WISCONSIN: *Basic Science*. Madison, April 6. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical*. Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

Tennessee Endorsement Report

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports fourteen physicians licensed by endorsement from Aug. 10 through Dec. 22, 1939. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Arkansas School of Medicine.....	(1936)		Arkansas
Atlanta School of Medicine.....	(1911)		Georgia
Emory University School of Medicine.....	(1911)		Alabama
Northwestern University.....			Michigan
University of Kansas School of Medicine.....			Oklahoma

University of Louisville School of Medicine.....	(1936)		Kentucky
Tulane University of Louisiana School of Medicine.....	(1936)		Louisiana
Johns Hopkins University School of Medicine.....	(1936)		Maryland
Harvard Medical School.....	(1936)		Georgia
Syracuse University College of Medicine.....	(1936)		New York
University of Rochester School of Medicine.....	(1934)		New York
Ohio State University College of Medicine.....	(1934)		Ohio
University of Pennsylvania School of Medicine.....			B. M. Ex. Carolina
Medical College of the State of South Carolina.....			

North Carolina Reciprocity Report

Dr. W. D. James, secretary, Board of Medical Examiners of the State of North Carolina, reports thirty-one physicians licensed by reciprocity and eight physicians licensed by endorsement on June 19 and Dec. 11, 1939. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine.....	(1938)		Virginia
Emory University School of Medicine.....	(1937)		Georgia
Northwestern University Medical School.....	(1928)		Michigan
Rush Medical College.....	(1924)		Illinois
University of Illinois College of Medicine.....	(1920)		Illinois
Louisiana State University Medical Center.....	(1938)		Louisiana
Tulane Univ. of Louisiana School of Medicine (1930), (1934)			Louisiana
(1939) Georgia			
Johns Hopkins University School of Medicine (1929), (1934)			Maryland
University of Maryland School of Medicine and College of Podiatric Medicine.....			Maryland
Harvard University.....			Georgia
University of Nebraska.....			Nebraska
University of New York.....			New York
Duke University School of Medicine.....	(1937)		Michigan
Ohio State University College of Medicine.....	(1938)		Ohio
Western Reserve University School of Medicine.....	(1929)		Ohio
Medical College of the State of South Carolina.....	(1926)		S. Carolina
Meharry Medical College.....	(1934)		Tennessee
University of Tennessee.....			Tennessee
Vanderbilt University.....			Tennessee
Medical College of Virginia.....			Virginia
Univ. of Virginia De.....			Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists.....	(1933)		N. B. M. Ex.
Duke Univ. School of Medicine.....	(1933), (1936, 2), (1937, 3)		N. B. M. Ex.
University of Cincinnati College of Medicine.....	(1936)		U.S.P.H.S.

Michigan October Examination

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports the written examination held at Lansing, Oct. 11-13, 1939. The examination covered fourteen subjects and included 100 questions. An average of 75 per cent was required to pass. Thirteen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1939) 78, 82,*	84,*	85.6†
Rush Medical College.....	(1939)		80†
Harvard Medical School.....	(1937) 84, (1938) 78†		
Wayne University College of Medicine.....	(1939) 77,*	81.5,†	85†
Long Island College of Medicine.....	(1939)		78.5†
Temple University School of Medicine.....	(1935)		82†

Seventy-five physicians were licensed by reciprocal indorsement from Aug. 3 through Dec. 26, 1939. The following schools were represented:

School	LICENSED BY INDORSEMENT	Year Grad.	Indorsement of
University of Arkansas School of Medicine.....	(1938)		Arkansas
College of Medical Evangelists.....	(1932)		New Mexico
(1939) California, N. B. M. Ex.			
Stanford University School of Medicine.....	(1939)		California
Yale University School of Medicine.....	(1937)		N. B. M. Ex.
George Washington University School of Medicine.....	(1938)		N. B. M. Ex.
Georgetown University School of Medicine.....	(1937)		N. B. M. Ex.
Howard Univ. College of Medicine.....	(1925)		Alabama
University of Georgia School of Medicine.....	(1937)		Louisiana
Illinois Medical College.....	(1909)		Georgia
Loyola University School of Medicine.....	(1932)		Illinois
(1938, 2) (1939) Illinois			Ohio
Northwestern University Medical School.....	(1937), (1939)		Illinois
(1938) Connecticut, (1939) Ohio			
Rush Medical College (1922), (1937) Illinois, (1931), (1936)			N. B. M. Ex.
University of Illinois College of Medicine.....	(1936)		Illinois
Indiana University School of Medicine.....	(1938)		Indiana
State University of Iowa College of Medicine (1920), (1931), (1932), (1937), (1938, 3)			Iowa
University of Kansas School of Medicine.....	(1936), (1938, 2)		Kansas
University of Louisville School of Medicine.....	(1932)		Kentucky
Johns Hopkins University School of Medicine (1918), (1939)			Maryland
N. B. M. Ex.			
Creighton University.....	(1936)		Vermont
Boston University.....			B. M. Ex. New Hampshire
Harvard Medical School.....	(1938)		New Hampshire
Tufts College Medical School.....	(1939)		N. B. M. Ex.
University of Michigan Medical School.....	(1919), (1934)		Minnesota
University of Minnesota Medical School.....	(1919), (1934)		Minnesota
(1937) North Dakota			
St. Louis University School of Medicine.....	(1937)		California

University of Nebraska College of Medicine.....(1937)	Nebraska
Columbia University College of Physicians and Surgeons.....(1920), (1935) New York, (1929)	Kansas
Syracuse Univ. College of Med. (1931) N. B. M. Ex., (1937)	New York
University of Buffalo School of Medicine.....(1935)	New York
Duke University School of Medicine.....(1937) N. B. M. Ex.	Ohio
Ohio State University College of Medicine.....(1929), (1938, 2)	Ohio
Western Reserve University School of Medicine.....(1918)	Ohio
University of Oklahoma School of Medicine.....(1938)	Oklahoma
Hahnemann Medical College and Hospital of Philadelphia.....(1930), (1935)	Penna.
Jefferson Medical College of Philadelphia.....(1936)	Ohio
(1937) Pennsylvania, (1938) New York	
Temple University School of Medicine.....(1915)	Missouri
University of Pittsburgh School of Medicine.....(1935)	Penna.
Meharry Medical College.....(1938)	Tennessee
Vanderbilt University School of Medicine.....(1937) N. B. M. Ex.	Texas
University of Texas School of Medicine.....(1937), (1938)	Texas
University of Virginia Department of Medicine.....(1932)	Virginia

* This applicant has received an M.B. degree and will receive an M.D. degree on completion of internship. License has not been issued.
† License has not been issued.

Book Notices

The Dysenteric Disorders: The Diagnosis and Treatment of Dysentery, Sprue, Colitis and Other Diarrheas in General Practice. By Philip Manson-Bahr, C.M.G., D.S.O., M.D., Senior Physician to the Hospital for Tropical Diseases, London. With an appendix by W. John Muggleton, M.S.M. Cloth, Price, \$8. Pp. 613, with 129 illustrations. Baltimore: William Wood & Company, 1939.

This comprehensive work is the result of experience in the tropics and of extensive practice in the Hospital for Tropical Diseases in London. In the course of the clinical work in this hospital in the last thirty years the author has made a study of 508 cases of amebic dysentery, 423 of sprue, 107 of bacillary dysentery, 116 of mucous colitis and forty-two of ulcerative colitis, as well as many cases of other intestinal diseases. This background has afforded a rich experience and a fund of practical knowledge which has provided the material for this much needed book.

The contents fall into nine sections: introduction; bacillary, protozoal and helminthic dysenteries; infective diarrheas; steatorrheas; disorders of the colon resembling dysentery; general disorders resembling dysentery, and other causes of diarrhea and dysenteriform symptoms. Ninety-four treat of bacillary dysenteries, 133 of amebiasis and seventy-eight of sprue and related conditions.

The author stresses the necessity of sigmoidoscopy except when diagnosis is made certain by the recognition of the causative organism in the stools. The mere list of details to be inquired into in a clinical examination fills nearly three pages, with full directions for the procedures.

The historical survey records the recurrence of epidemics of dysentery in the sixth and eighth centuries A. D. and the introduction of ipecacuanha or the "dysentery root" from Brazil in the seventeenth century. Jacobus Bontius, the "grandfather of tropical medicine," described the epidemic of dysentery in Java in 1628. Sydenham, Morton and Willis distinguished between mucous evacuations and bloody flux in the great epidemic of 1668-1672 and noted the association of dysentery and arthritis. Zimmermann, who studied the epidemic in Switzerland, described (1767) the clinical varieties of dysentery. During the first half of the nineteenth century dysentery was generally regarded as but one expression of malaria, partly because of its seasonal recurrence and pandemic character. Epidemics occurred in the American colonies in 1749-1753, 1773-1777 and 1793-1798. In the epidemic of 1834-1836 in Europe it was estimated that fourteen of every thousand inhabitants perished. The dysenteries have long been associated with famine and have followed armies in all wars. A notable omission by the author in the text but not in the bibliography is that of Schaudinn's critical distinction of *Endamoeba histolytica*, which settled the futile discussion that raged from 1875 to 1903 over the pathogenicity of amebas of the human colon. Even less understandable is the omission of any reference to the extensive protozoal observations of Lewis (1870) in the examination of stools of cholera victims in India.

The discussion of amebiasis is exhaustive and thorough. Special attention is given to liver abscess and to treatment. The author is conservative in matters of treatment, adhering to the use of the drastic emetine-bismuth-iodide therapy though favor-

ing lighter doses and using it in conjunction with chinfoen enemas. He notes with regard to vioform that "he has seen several patients who appear to have been made really ill by its constant use." He rejects acetarsone except as an intestinal tonic and in the after-care of amebic dysentery on the ground that the French claims as to its value as a reliable amebicide have not been substantiated. He notes the wide use of carbarsone in the treatment of chronic amebiasis in the United States and the fact that it is less toxic than acetarsone but states that it should be administered only under supervision. The resort to surgical measures even in resistant cases of intestinal amebiasis is deprecated.

The author rejects McCarrison's dietetic deficiency and Ashford's yeast fungus as factors in the origin of sprue and regards the cause as a specific virus capable of lying dormant in the tissues for years and of being roused to activity by unknown factors. This view is supported by the definite incubation period, the patchy geographic distribution, familial occurrences, and clinical observations showing that it is a specific inflammation of the mucous membranes of the alimentary tract. Malaria and amebiasis are predisposing causes. Rest, high protein diet and palliative medicinal treatments for the various symptoms are given in detail. The discussion of the varied aspects of this disorder is a fine illustration of a comprehending view of disease and its cure.

The appendix deals with the clinical laboratory procedures in diagnosis and culture of the micro-organisms concerned in these intestinal infections. The classified bibliography of twenty-four pages contains about 1,500 entries of author and citation but usually not of titles, the omission of which robs the bibliography of much of its value, since the reader has no clue beyond the classified heading as to the content of the articles. The index is of great value in finding in this great mass of valuable data the information desired on varied subjects.

The author has rendered a great service to both physicians in general practice and to investigators of diseases of the alimentary canal and their causative organisms by this exhaustive and critical treatise.

Electrocardiographic Patterns: Their Diagnostic and Clinical Significance. By Arlie R. Barnes, M.D., Mayo Clinic, Rochester, Minnesota. Cloth. Price, \$5. Pp. 197, with 95 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, Publisher, 1940.

This monograph is an outgrowth of an exhibit which the author made and found to be extremely popular. It is a thoughtful coordination of the author's own extensive studies correlated with those appearing in the literature and, while one may not agree with all the deductions arrived at, the book definitely represents a mature consideration and will be a valuable addition to the library of every one who has to deal with electrocardiograms. As the author points out in his introduction, "the proportion of the average text on electrocardiography devoted to the arrhythmias would lead one to believe that this was still the field of its major importance. More recently, the use of the electrocardiograph to detect evidences of myocardial disease has been of major interest and importance to clinicians, and it has been possible to correlate such evidence of myocardial disease with prognosis in large groups of cases, although it is difficult to apply this knowledge to the individual patient in a group."

It is becoming increasingly apparent, primarily as the result of the efforts of American students of this subject, that the primary utility of the electrocardiogram in clinical practice rests on a study of its configuration. In this monograph the greatest stress is properly given to the appearance of the electrocardiogram in coronary disease and in myocardial infarction, but the more recently developed and growing subject of the electrocardiographic appearance in other diseases is also considered. The author discusses strains on the left and on the right side of the heart, pericarditis, infections, metabolic disorders and drugs. The last chapter is devoted to the newly developed subject of precordial leads and includes a number of summary tables of the measurements in 100 normal cases of the deflections in all the chest leads recommended recently by the Committee of the American Heart Association on the Standardization of Precordial Leads. These tables should be extremely useful to the reader in setting up the limits of normality for those chest leads which are not commonly employed.

The text is well documented with case reports, electrocardiograms and idealized diagrams. It is regrettable that the author uses the old way of depicting the direction of the deflections of the chest lead; this is upside down to that recommended by the committee, of which the author himself was a member. It is difficult to see why the author did this when it would have been easy to redraw the drawings of his records as inverted mirror images. The failure to follow the newly and universally established standard for the chest lead and the consequent use of terms in the text applicable to the lead as illustrated will be confusing to the average reader. It is hoped that in the next edition the author will take the trouble to correct this error. Confusion may also arise from the fact that various terms are applied in the text to the segment between QRS and T deflections. Nevertheless, those interested in clinical electrocardiography will find that this monograph is extremely stimulating and helpful in filling a gap by a critical assay of the recent literature on the configuration of the electrocardiogram.

Common Skin Diseases. By A. C. Roxburgh M.A., M.D., B.Ch., Physician in Charge of the Skin Department, St. Bartholomew's Hospital, London. Fifth edition. Cloth. Price, 15s. Pp. 416, with 187 illustrations. London: H. K. Lewis & Co., Ltd., 1939.

The original purpose of the author and the publishers was to provide a small compact work for the general practitioner covering the commoner skin diseases. This book deals with 120 of more than 300 skin diseases. The fact that it has already run through four editions attests its popularity. Constant revision has kept it thoroughly abreast of progress. To assist the student, an index of preliminary diagnoses has been placed at the beginning of the book to encourage him to observe accurately the type of lesion of which any given eruption is composed and to serve as a guide in looking up diseases in the book or in larger works. The various diseases are well described, briefly but adequately. Considerable emphasis is placed on differential diagnosis and treatment, and both of these are well handled. Treatment reflects the long experience of the author; it is brief but very much to the point. In this edition there are fourteen new illustrations, some notes on the new emulsifying bases, indications for administering estrogen and the therapeutic possibilities of sulfanilamide therapy. There are short new articles on the avitaminoses and granuloma annulare. The dosage of roentgen therapy is expressed in roentgens instead of pastilles. The illustrations are excellent. The text is printed with large, legible type on good paper. The book is an excellent one and if its present standard is continued it will remain a popular textbook for years to come.

Ophthalmology. By Burton Chance, M.D. XX, *Clio Medica: A Series of Primers on the History of Medicine*. Edited by E. B. Krumbhaar, M.D. Cloth. Price, \$2. Pp. 240, with 6 illustrations. New York: Paul B. Hoeber, Inc., 1939.

Bacteriology. By William W. Ford, M.D., D.P.H. XXII, *Clio Medica: A Series of Primers on the History of Medicine*. Edited by E. B. Krumbhaar, M.D. Cloth. Price, \$2.50. Pp. 207, with 8 illustrations. New York & London: Paul B. Hoeber, Inc., 1939.

These books constitute new additions to the excellent series under the general editorship of E. B. Krumbhaar.

Dr. Chance has traced the progress of ophthalmology from the earliest of written records to the present time. The nature of the eye made it particularly subject to superstitions. Thus the literature of every region is replete with notions, some of which, however, later became established as fact. After a series of chapters in which the lore of various nations is reviewed, the author gives special attention to cataract, color vision, the development of drugs and ophthalmic surgery, and finally provides concluding chapters on ophthalmic education, organizations and national development. The work is a concise summary of the history of ophthalmology.

The volume on bacteriology, by Dr. W. W. Ford, is dedicated to Dr. William H. Welch. After considering the development of knowledge concerning magnification and the work of Leeuwenhoek, he carries forward his story in chronological order through the work of Henle, Pasteur, Lister, Cohn and Koch. He reveals in his concluding chapters the manner in which immunology developed from bacteriology. The rigid bacteriology of the century has been modified and future investigations must concern themselves with the life cycle of individual types of organisms.

Primer of Allergy: A Guidebook for Those Who Must Find Their Way Through the Mazes of This Strange and Tantalizing State. By Warren T. Vaughan, M.D. Cloth. Price, \$1.50. Pp. 140, with illustrations by John P. Tillery. St. Louis: C. V. Mosby Company, 1939.

Occasionally concise treatises for the public are written on subjects of which insight and understanding are necessary for intelligent cooperation. The subject of allergy is certainly an ideal assignment for well placed literary effort, and Dr. Vaughan has done much with it. Many physicians and certainly a larger number of laymen have desired a book of this type for some time and it should be enthusiastically received. The book is so written that it can be recommended by any physician regardless of his personal approach to the subject. In fact, a book of this type placed in the hands of his patient should prove a real service to him in his practice. The text is profusely and attractively illustrated by cartoons and caricatures on allergy. It not only provides authoritative information on all phases of the subject of allergy but is written in a literary style that is both engaging and entertaining. Every physician will enjoy reading this concise and masterful message to the public and will unquestionably recommend it to his allergic patient. This is a real contribution to the layman's education in this important and complex field of medical science and deserves a place in every home where there is sneezing and wheezing.

Traité d'ophtalmologie. Publié sous les auspices de la Société française d'ophtalmologie par MM. P. Baillart, Ch. Coutela, E. Redslob et E. Velter. René Onfray: Secrétaire général. Tome III: Techniques de laboratoire, examen de la motilité et de la vision binoculaire, anomalies de la vision, pathologie (début). Par MM. E. Aubaret et al. Cloth. Price, 400 francs. Pp. 1,148, with illustrations. Paris: Masson & Cie, 1939.

This volume of the new French treatise was somewhat late in making its appearance but still was under the time schedule set in the beginning. It contains laboratory technic in ophthalmology in four parts by Dubois-Poulson of Paris, Carrère of Montpellier and Senevet of Algiers, examination of motility by Nordman of Strasbourg and Onfray of Gouin, anomalies of vision, light and color sense by Joseph of Paris, Mawas of Paris, Hambreson of Brussels, Haas of Paris, Bourdier of Beaujon and Polak of Paris, and general and special pathology divided into lesions by Redslob and Gery of Strasbourg, ocular allergy by Koutseff of Strasbourg, the vitamins by Bezssonoff of Strasbourg, relationship of pathology to ophthalmology by Terrien of Paris, internal secretions by Francescetti and Gorin of Geneva, general ophthalmic semeiology by Terrien of Paris, diseases of the superciliary area by Villard of Montpellier, diseases of the lids by Aubaret of Marseilles, tumors of the lids and lacrimal caruncle by Kalt of Paris, and disturbances of the motor apparatus of the lids by Jean-Sédan of Marseilles. With the great variety of material, this volume is even more spotty in character than are its predecessors. The chapters dealing with examination of the eyes by various methods are probably the weakest that have appeared thus far. In contrast to that the chapter on tumors of the lids by Marcel Kalt is as complete and thorough as can be found anywhere in the literature. This volume contains fewer illustrations than the others, although the few color plates in the closing chapters are good. The general format of the volume complies with that set up for the entire series.

Food Control: Its Public Health Aspects. A Manual for Regulatory Officers, Food Technologists, and Students of the Food Industry. By James Houston Shrader, Ph.D., Instructor in Biochemistry, School of Hygiene and Public Health, Johns Hopkins University, Baltimore. Cloth. Price, \$4. Pp. 513. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Limited, 1939.

This is a unique contribution to the literature on food control. It provides not only a discussion of the public health aspects of control measures but also a discussion of the nutritional significance of different phases of food technology. Each class of products is discussed from the points of view of technology, relation to public health and problems of regulatory control. The author, who is now editor of the *Journal of Milk Technology*, has had extensive experience in the subject matter covered by the book. The manual contains information about many new products that have been but recently placed on the market. It is a readable book that will be indispensable for all regulatory officers, food technologists and students of the food industry.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Corporate Practice Authorized Neither by Charter of Corporation nor by Dental Act.—The state of Indiana, on the relation of the board of medical examiners, sought to enjoin the Boston System Dentists, a corporation, from practicing dentistry in Indiana. The trial court denied the injunction and the state appealed to the Supreme Court of Indiana.

The defendant corporation was incorporated under the general laws of Indiana on March 2, 1917, "for the purpose of engaging in and carrying on the business of dentistry and every branch thereof; the manufacturing, buying, selling and dealing in dental supplies, artificial dentists' crowns and bridgework, porcelain and gold inlays and other merchandise; printing and advertising and doing all other acts connected with or incident to the business of dentistry or any branch thereof." The corporation maintained in the city of Gary an office with the usual facilities used by practicing dentists. It owned the equipment and paid the operating expenses of the office. Two licensed dentists used the facilities and carried on a dental practice in the office, fees being collected by a cashier employed by the corporation and remitted by her to its treasurer in Chicago. The dentists received, by way of remuneration, salaries fixed by contract and commissions depending on the volume of income.

The original dental practice act of Indiana, enacted in 1913, prohibited "any person" from practicing dentistry without a license, and this prohibition was still in effect at the time of the trial of this case. An amendment to the dental practice act became effective on March 9, 1917, seven days after the defendant's incorporation, providing as follows:

That it shall not be unlawful for any one duly licensed to do so, to practice dentistry, or to hold himself out as a practitioner of dentistry, under the name of any legally incorporated dental company, existing and in operation prior to the taking effect of this act.

It was conceded that the defendant had no license to practice dentistry. The substantial question before the court was whether the defendant was engaged in the practice of dentistry and what rights, if any, it possessed under its charter and under the dental practice act as amended in 1917. The corporation contended that (1) it was not engaged in the practice of dentistry; (2) the business in which it was engaged was specifically authorized by its charter and by the 1917 amendment to the dental practice act; (3) the injunctive process was not an appropriate enforcement remedy, and (4) to grant the injunction would constitute a forfeiture of its character and would destroy its vested rights in violation of the principles of constitutional law.

In the opinion of the Supreme Court, the defendant's method of doing business constituted the practice of dentistry on its part. It occupied the relation of master toward the licensed dentists who performed the actual services; they were its servants for hire. The regulation of the dental profession, the court pointed out, is not generally dissimilar in effect to that imposed on the practice of medicine, and it has been held that a corporation may not lawfully engage in the practice of medicine directly or by employing licensed persons for that purpose. *Herman v. Baker* (Ind.), 15 N. E. (2d) 365. The same rule is applicable to the practice of dentistry. The 1917 amendment to the dental practice act authorized any one licensed to practice dentistry to hold himself out as a practitioner under the name of any legally incorporated dental company existing and in operation prior to the taking effect of the amendatory act. This proviso, the court pointed out, was clearly for the benefit of persons legally licensed to practice dentistry. It may not be construed to extend any privileges to a corporation.

In answer to the contention interposed by the corporation that the remedy of injunction was not proper because the practice of dentistry without a license is a misdemeanor, punishable by fine and imprisonment, the court pointed to the fact that the dental practice act specifically authorizes the use of the injunctive process. But, the court continued, if an injunction is not specifically authorized the situation presented in the present

case would bring it within the rule applicable where the protection of the public welfare is involved. In such cases equity will intervene notwithstanding the fact that the wrong complained of may also be a crime.

To prohibit the corporation from engaging in the unauthorized practice of dentistry by injunction does not destroy any of its vested rights, the court said. The practice of dentistry is a personal privilege and not a matter of right. It is a profession and not a business. The corporation acquired no right to engage in that profession by reason of its articles of incorporation, adopted in 1917, because the state had already restricted the right to practice dentistry, by the dental practice act of 1913, in such a manner as to exclude corporations. Nor would the corporation's corporate franchise be forfeited by restraining it from unlawfully engaging in the practice of dentistry. By the terms of its charter, the corporation may legitimately manufacture, buy, sell and deal in dental supplies and other merchandise. It cannot be enjoined from engaging in that business; but it may not follow a skilled profession the practitioners of which are required to have a personal license.

The judgment of the trial court was therefore reversed with directions to enter judgment for the state permanently enjoining the corporation from engaging in the practice of dentistry in Indiana.—*State ex rel. Indiana State Board of Dental Examiners v. Boston System Dentists (Ind.)*, 19 N. E. (2d) 949.

Society Proceedings

COMING MEETINGS

- Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
- Alabama, Medical Association of the State of, Birmingham, Apr. 16-18. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for the Study of Neoplastic Diseases, Louisville, Ky., Apr. 11-13. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- American Association of Anatomists, Louisville, Ky., Mar. 20-22. Dr. E. R. Clark, Dept. of Anatomy, Univ. of Pennsylvania School of Medicine, Philadelphia, Secretary.
- American Association of Pathologists and Bacteriologists, Pittsburgh, Mar. 21-22. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.
- American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.
- American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.
- American Orthopedic Association, Kansas City, Mo., May 4-10. Dr. Ralph K. Gormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.
- American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
- American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixer, 319 Longwood Ave., Boston, Secretary.
- Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie R. Kober, 15 East Monroe St., Phoenix, Secretary.
- Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
- Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
- California Medical Association, Coronado, May 6-9. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.
- Florida Medical Association, May 29-May 31. Dr. Shaler Richardson, 111 West 1st St., Miami, Secretary.
- Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
- Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-24. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.
- Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. B. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
- Missouri State Medical Association, Joplin, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 634 North Grand Blvd., St. Louis, Executive Secretary.
- Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. R. B. Adams, 416 Federal St., Lincoln, Secretary.
- New York, Medical Association of, New York, May 6-9. Dr. Peter Irving, 2 E. 6th St., New York, Secretary.
- North Dakota State Medical Association, Minot, May 6-8. Dr. Albert W. Skelsey, 20 1/2 North Broadway, Fargo, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 9. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glenn Bell, University of California Hospital, San Francisco, Secretary.
- Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

37: 493-672 (Dec.) 1939

- Gliomas in Animals: Report of Two Astrocytomas in Common Fowl. E. Jungherr and A. Wolf, New York.—p. 493.
- Mammary Glands of Mature Female Mice of Strains Varying in Susceptibility to Spontaneous Tumor Development. W. U. Gardner, L. C. Strong and G. M. Smith, New Haven, Conn.—p. 510.
- Effect of Dibenzanthracene on Liver. A. Goerner and M. Margaret Goerner, Brooklyn.—p. 518.
- Dibenzanthracene Mouse Sarcomas: Histology. W. H. Lewis, Baltimore.—p. 521.
- Local Effect of Zinc on Development of Marsh Buffalo Adenocarcinoma. F. Bischoff and M. Louisa Long, Santa Barbara, Calif.—p. 531.
- Chromosomal and Extrachromosomal Influence in Relation to Incidence of Mammary Tumors in Mice. W. S. Murray and C. C. Little, New York.—p. 536.
- Artificial Benignancy of Neoplasm: III. Metabolism of Sarcoma 180 Growing at Different Rates. J. Muus, F. N. Craig and W. T. Salter, Boston.—p. 553.
- Retention of Immunizing Power by Shope Papilloma After Exposure to Ultraviolet Radiation. W. H. Woglum and J. Warren, New York.—p. 562.
- *Study of Fuchs Reaction for Cancer. O. Rosenthal, Philadelphia.—p. 566.
- Polarographic Studies of Human Blood Serums. A. C. Walker, Short Hills, N. J., and S. P. Reimann, Philadelphia.—p. 585.

Fuchs Reaction for Cancer.—Rosenthal reviews the literature on serologic tests for cancer. Of all the cancer tests based on reactions between serums and cancer-specific substances, only the test of Fuchs has been verified by many authors. Since technical difficulties, to which occasional failures of the reaction had been ascribed, were eliminated by Minibeck, the author studied the value of the modified test and found that the Fuchs reaction demonstrates differences between serums from patients with and without cancer only in a statistical sense but is without real value for diagnosis in an individual case. The chief difficulty of the test lies neither in the technic of the reaction nor in the preparation of the substrates but in the fact that the selection of specific substrates of such activity that the reaction values are unquestionably beyond the range of error is a matter of chance. A comparison of the results of other authors using the Fuchs test supports these observations, although most of the conclusions are more favorable. Whether the test can be of any aid in the diagnosis and prognosis of cancer in the patient can be decided only if the mechanism of the reaction can be explained in detail.

American Journal of Clinical Pathology, Baltimore

10: 1-132 (Jan.) 1940

- *Observations on Human Beings with Cancer, Maintained at Reduced Temperatures of 75 to 90 F. L. W. Smith and T. Fay, Philadelphia.—p. 1.
- Current Conceptions of Physiology of Kidney. J. M. Hayman Jr., Cleveland.—p. 12.
- Renal Function. M. H. Barker, Chicago.—p. 21.
- Clinical Aspects of Renal Disease. L. Leiter, Chicago.—p. 30.
- Studies on Experimental Hypertension: XII. Experimental Production and Pathogenesis of Hypertension Due to Renal Ischemia. H. Goldblatt, Cleveland.—p. 40.
- A One Hour Renal Condition Test. W. G. Exton and A. R. Rose, Newark, N. J.—p. 73.
- Treatment of Pneumonia with 2-(P-Aminobenzenesulfamido) Pyridine. A. V. St. George, A. F. Kraetzer and W. Magee, with assistance of W. S. Gibbs Jr. and L. Stix, New York.—p. 97.

Reduced Temperatures and Cancer.—From December 1938 to October 1939, Smith and Fay subjected thirty-three patients to seventy-five individual inductions of reduced body temperature ranging from 74 to 90 F. These patients were in the hopeless and terminal stages of cancer, presenting themselves chiefly for relief of pain. They have had all the surgical and radiation treatment indicated and have been as a whole in

extremely poor physical condition; emaciated, cachectic, often anemic. Physiologic data from a study of these patients while in this physical state, resembling "hibernation" in many respects, is recorded. An enormous amount of work will be necessary before any conclusions can be drawn. Previous to these studies it was the general impression that prolonged reduction of temperature below 94 or 95 F. was inevitably fatal. These studies have shown that patients can be maintained for from five to eight days at temperature levels in the eighties, that relief of pain can be regularly anticipated for from a few days to as long as five months, and that regressive changes in young embryonal cells, particularly in carcinoma, take place as a result. The authors believe that the lowered physiologic activity due to the low temperature interferes with the metabolism of these cells. The studies suggest that the entire body economy is reduced, that the circulatory rate and blood flow are slowed and that the liver is in a relatively dormant and inactive state as shown by low nitrogenous analyses of the blood. The basal metabolism is apparently reduced from 20 to 25 per cent. Lower figures may well be anticipated when special methods are devised for more accurate recording. The procedure is not entirely devoid of risk. It is perhaps more particularly applicable from the clinical standpoint to chronic cases for the control of pain, especially to the terminal stages of cancer of bedridden patients. Its usefulness in the therapeutic field otherwise remains a problem to be solved in the future.

American J. Digestive Diseases, Huntington, Ind.

7: 1-76 (Jan.) 1940

- Dilatation of Bile Ducts and Its Relation to Distress After Cholecystectomy. K. W. Benson, Rochester, Minn.—p. 1.
- Comparative Value of Serial Hippuric Acid Excretion, Total Cholesterol, Cholesterol Ester and Phospholipid Tests in Diseases of Liver: II. Clinical Comparison of Tests. F. W. White, E. Deutsch and S. Maddock, Boston.—p. 3.
- Symptomatology of Chronic Atrophic Gastritis. R. Schindler, Chicago, and H. M. Murphy, Buffalo.—p. 7.
- Desiccated Hog's Stomach Extract (Ventriculin) in Treatment of Atrophic Gastritis. L. Schiff and S. Goodman, Cincinnati.—p. 14.
- *"Clubbed Fingers" and Ulcerative Colitis. C. P. Schlicke and J. A. Barga, Rochester, Minn.—p. 17.
- Effect of Barbiturates on Digestive Secretion. R. J. Coffey, T. Koppányi and C. R. Linegar, Washington, D. C.—p. 21.
- *Vitamin B Complex and Its Constituents in Functional Digestive Disturbances. F. F. Chesley, Jean Dunbar and L. A. Crandall Jr., Chicago.—p. 24.
- Peptic Ulcer Treated by Posterior Pituitary Preparations: Clinical and Experimental Observations. M. H. Metz and R. W. Lackey, with collaboration of P. E. Wigby, A. B. Small and C. O. Patterson, Dallas, Texas.—p. 27.
- Clinical Results from Continuous Intragastric Drip Using Colloidal Aluminum Hydroxide in Treatment of Peptic Ulcer. J. T. Eads, Philadelphia.—p. 32.
- Etiology of Tuberculous Anal Abscess and Fistula. C. L. Martin, W. I. Lansford and H. C. Swencay, Chicago.—p. 36.
- Pectinates, with Special Reference to Nickel Pectinate and Their Therapeutic Value. P. B. Myers and A. H. Rouse, New York.—p. 39.
- Gastrointestinal Pseudoleukemia: Report of Case. S. Tannhauser and R. Davison, Tucson, Ariz.—p. 45.

"Clubbed Fingers" and Ulcerative Colitis.—Schlicke and Barga point out that clubbing of the fingers is seldom a primary condition. Bronchiectasis, pulmonary tuberculosis, empyema and mediastinal or pulmonary tumor are commonly present. Isolated cases have been reported to follow various disorders of the kidneys and liver, amyloid disease and cachexia strumipriva. There has been little mention of clubbed fingers as a sequela of chronic ulcerative colitis. The authors review seven instances of clubbed fingers in patients under treatment for chronic ulcerative colitis seen within the last two years at the Mayo Clinic. In none of these cases was there evidence of any other primary disease. To explain clubbed fingers as a sequela of ulcerative colitis is as unsatisfactory as attempting to explain its more frequently associated occurrence with other conditions.

Vitamin B Complex and Digestive Disturbances.—Chesley and his associates state that a high percentage of forty-four patients with various functional digestive disturbances were improved by the administration of a vitamin B complex concentrate in large doses. That these patients were deficient in the vitamin B complex was suggested not only by the results of treatment but also by the demonstration of an abnormally low excretion of one of the vitamin B complex constituents (thiamin). Preliminary tests indicated that effectiveness of the whole complex is not due to vitamin B₁ (thiamin) or to vitamin B₂ (riboflavin). Part of the effectiveness is due to the action of the

nicotinic acid. The authors do not wish to suggest that nicotinic acid in pure crystalline form should find a place in the treatment of functional digestive disorders. The use of the whole vitamin B complex appeals to them as a more rational procedure because in their experience it produces better therapeutic results and it is probable that deficiencies of several vitamin B complex fractions are more common than deficiencies of a single factor.

American Journal of Medical Sciences, Philadelphia

199:1-156 (Jan.) 1940

- *Nature of Hemorrhagic Disease of the Newborn: Delayed Restoration of Prothrombin Level. A. J. Quick and A. M. Grossman, Milwaukee.—p. 1.
- Blood Studies on the Newborn: II. Direct and Total Blood Bilirubin: Determinations over a Nine Day Period, with Special Reference to Icterus Neonatorum. T. R. Waugh, F. T. Merchant and G. B. Maughan, Montreal.—p. 9.
- *Double Quotidian Temperature Curve of Gonococcic Endocarditis: Diagnostic Aid. P. H. Fletcher, Baltimore.—p. 23.
- Role of "Static Blood Pressure" in Abnormal Increments of Venous Pressure, Especially in Heart Failure: I. Theoretical Studies on Improved Circulation Scheme Whose Pumps Obey Starling's Law of the Heart. I. Starr and A. J. Rawson, Philadelphia.—p. 27.
- Id.: II. Clinical and Experimental Studies. I. Starr, Philadelphia.—p. 40.
- *Treatment of Pneumococcic Pneumonia: Comparison of Results Obtained with Specific Serum and with Sulfapyridine. H. F. Dowling and T. J. Abernethy, Washington, D. C.—p. 55.
- Cure of Type XIV Pneumococcic Meningitis by Sulfapyridine, Confirmed by Autopsy: Case Report. L. L. Terry and E. E. Beard, Cleveland.—p. 63.
- *Chloride Excretion in Hypopituitarism, with Reference to Adrenocortical Function. D. J. Stephens, Rochester, N. Y.—p. 67.
- Amount of Lymphoid Tissue of Human Appendix and Its Weight at Different Age Periods. J. M. S. Hwang and E. B. Krumhaar, Philadelphia.—p. 75.
- Further Studies of Intracutaneous Method of Typhoid Vaccination. L. Tuft, Philadelphia.—p. 84.
- Natural History and Diagnosis of Gastric Ulcer. J. L. Drossner and T. G. Miller, Philadelphia.—p. 90.
- Evidence Regarding Control of Hepatic Glycogenolysis. W. B. Cannon, Boston.—p. 98.
- Simplified Method for Calculating Diabetic Diets. R. Richardson, Philadelphia.—p. 102.

Hemorrhagic Disease of Newborn Infants.—Quick and Grossman studied the prothrombin concentration of the blood of newborn infants with Quick's method. They conclude that at birth the prothrombin in the baby's blood is relatively high but often drops precipitously during the first days of life and then, strangely, is restored spontaneously. The frequency with which the prothrombin falls in normal infants makes it highly probable that all infants are in danger of hemorrhage during the first few days of life. In the recognized neonatal hemorrhagic disease it is likely that the fundamental cause is a delay in the spontaneous restoration of the prothrombin level. Consequently, if an infant should bleed accidentally the small loss of blood may be sufficient to reduce the already low prothrombin level to a point at which hemorrhage becomes difficult to control and a vicious circle is initiated. The cause of the prothrombin deficiency seems to be an inadequate storage of prothrombin or of vitamin K in the fetus. Presumably as soon as the baby is born the physiologic demands promptly exhaust the available prothrombin. As there is apparently a reserve neither of vitamin K nor of prothrombin, a marked decrease of the latter occurs. The condition is clearly due to a lack of vitamin K, for the prothrombin can be restored promptly to normal by giving the baby an oral concentrate of this vitamin and the serious fall in concentration can be prevented. Since the drop in prothrombin is distinctly a manifestation of vitamin K deficiency, the rise must be due to a supply of this vitamin which was not present at birth, and since the food intake during the first few days is scarcely sufficient to assure an adequate supply, another source must be sought. Bacteria readily synthesize vitamin K (Almquist). At birth the intestinal contents of the baby are sterile, but in a very short time, especially if the baby is allowed to suckle, bacteria are introduced and an intestinal flora is established. The time relation between the beginning of bacterial activity and the restoration of the prothrombin level makes it appear likely that the available vitamin K is of bacterial origin. The practice of putting the baby to the breast early may serve the primary purpose of introducing harmless but useful bacteria into the alimentary tract. Although no positive proof exists that neonatal cerebral hemorrhage is one form of "hemorrhagic disease," it seems very likely that it is and that the lowered prothrombin is the important factor. If the clotting agent were

normal in amount, the excess of thromboplastin which is present in the brain would speedily stop the hemorrhage. As the baby is apparently not born with a marked deficiency of prothrombin, its fall can be accomplished by administering vitamin K orally. But in the normal infant this hardly seems necessary. Perhaps a return to the practice of early breast feeding will be sufficient. But in any case of difficult labor with probable intracranial injury the oral administration of a concentrate of vitamin K should begin immediately and be continued for several days. Vitamin K should also be given promptly if slight oozing is noticed from the umbilical cord or any other small wound, or if blood appears in the stool or urine. Unless the hemorrhage is severe a direct blood transfusion need not be given, as vitamin K acts promptly. When the normal prothrombin level is once established in the baby it becomes difficult to cause any appreciable diminution. It is therefore usually possible to operate on a child after it is a week old without danger of untoward bleeding. But, if an operation must be performed earlier, the prothrombin should be determined by Quick's method and if it is low vitamin K should be given preoperatively.

Double Quotidian Temperature Curve of Gonococcic Endocarditis.—Fletcher discusses a particular form of temperature curve which seems relatively specific for gonococcic endocarditis. The temperature charts of twenty-four patients with gonococcic endocarditis were examined. The diagnosis was established by postmortem examination in twenty-two. Of the two instances not studied post mortem one blood culture was positive for the gonococcus before death and the other patient, whose blood culture was also positive, recovered from her illness. All of these twenty-four patients were in the hospital for six days or longer. Eleven of the twenty-four temperature charts showed the double peaks of fever for a period of from five to twenty-two consecutive days, the average being ten days. The prototype of these eleven patients is one who, at 6 a. m., has a shaking chill lasting a few minutes followed by a rise in rectal temperature from an initial level of 98 F. at 4 a. m. to 105 F. at 8 a. m., with subsequent sweating and a precipitous fall to 98 F. at 4 p. m. Then a repetition of the chill and the rest of the episode follows at 6 p. m., and the temperature returns to 98 F. by 4 a. m. of the next day only to renew the twelve hour cycle. There was moderate variation in the timing of the episodes from day to day in the same patient. The double peak temperature curve was not present during the whole period that the patient was observed. Usually a patient with a previously intermittent curve lapsed temporarily into the twelve hour cycles for a period of from one to three weeks, the curve subsequently becoming irregular again. Four patients with gonococcic endocarditis who were being treated with sulfanilamide were having the double quotidian fever when the drug was first administered but the double peak disappeared within forty-eight hours and the temperature curve was lowered subsequently. The phenomenon therefore will probably not be observed among patients receiving sulfanilamide. The patients who never showed the cycles usually had a high and intermittent fever, often with a regular twenty-four hour cycle and diurnal variations from 5 to 7 degrees F. None of the charts of three patients with gonococcic septicemia uncomplicated by endocarditis sustained double peaks, although two of them showed an irregular, double quotidian curve for forty-eight hours. The explanation for the twelve hour febrile cycle in gonococcic endocarditis is not apparent to the authors, but they emphasize the phenomenon as a valuable aid to diagnosis, feeling that it deserves somewhat more prominence than is assigned to it.

Pneumococcic Pneumonia.—Dowling and Abernethy compared the value of sulfapyridine and serum in the treatment of pneumonia. From September 1938 through July 15, 1939, they treated 226 consecutive cases of pneumonia; ninety of the patients were given serum alone, 130 sulfapyridine alone and six extremely ill patients received both the drug and the serum. Typing of each patient's sputum was performed at least once. One or more blood cultures from and roentgenograms were taken of nearly every patient. Cultures were made of all exudates and from the lungs at postmortem. From August until Nov. 17, 1938, before sulfapyridine became available, patients were treated with serum alone. After that, patients with type I pneumonia were alternated, one being given serum and the next

the drug. When a serum for a particular type was on hand, it was used; otherwise the patient was treated with sulfapyridine. Among the seventy cases of type I, II, V, VII or VIII pneumonia treated with serum there were ten deaths (14.3 per cent). There were five deaths among the fifty-two patients treated with sulfapyridine (9.6 per cent). The four individuals treated with a combination of serum and sulfapyridine died. When only the bacteremic cases are considered, there were three deaths among seventeen patients treated with serum and the same number among sixteen patients treated with the drug. When treatment was begun during the first four days of the illness, the mortality rate for the forty-six patients receiving their first dose of serum during this early period was 10.8 per cent and for the thirty-four receiving sulfapyridine it was 2.9 per cent. When pneumonias caused by all types of pneumococci are considered, the mortality of the ninety-six treated with serum was 16.7 per cent as compared to 11 per cent of the 136 treated with sulfapyridine. Among the bacteremic cases the percentages were 23.8 and 20, respectively. The effect of the therapeutic agents on the course of pneumonia is also evaluated by the incidence of empyema. Among the ninety-six serum-treated cases there were six cases of empyema, while among the 136 treated with sulfapyridine empyema developed in four. In comparing the two therapeutic agents with regard to their ability to cause a rapid crisis, the authors find that the most definite results were obtained in the pneumonias caused by types I, II, V, VII and VIII pneumococci. Among the sixty patients in this group who recovered after serum treatment, a crisis occurred within twelve hours in 43.3 per cent, within eighteen hours in 58.3 per cent and within twenty-four hours in 61.7 per cent. The corresponding figures for those receiving sulfapyridine were 29.8, 46.8 and 63.8 per cent. In short, an early crisis occurred more frequently among those treated with serum, but after twenty-four hours crises occurred as frequently among the patients receiving sulfapyridine as among those given serum. When pneumonias caused by all types of pneumococci are considered, the same trends are evident but to a much less degree. While both serum and sulfapyridine are of great value in the treatment of pneumonia, the authors do not believe that conclusions may yet be drawn as to their relative value in its routine treatment.

Hypopituitarism, Chloride Excretion and Adrenocortical Function.—According to Stephens, six of seven patients with clinical hypopituitarism, when studied under standard conditions of salt depletion, showed increased concentrations of chloride in the urine similar to that which has been found to be characteristic of adrenocortical insufficiency. Symptoms suggesting those of Addisonian crisis developed in four of the six patients. These symptoms were promptly relieved by the intravenous administration of sodium chloride, dextrose and adrenal cortex extract. Symptoms did not develop in two patients and chloride excretion was favorably modified after the administration of sodium chloride and adrenal cortex extract. One patient experienced striking clinical improvement during the administration of sodium chloride and adrenal cortex extract. These observations are interpreted as confirmatory evidence of the occurrence of chronic adrenocortical insufficiency in clinical hypopituitarism, presumably secondary to withdrawal of the adrenotropic anterior pituitary principle.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

43:1-152 (Jan.) 1940. Partial Index

- Wide Field Roentgen Therapy: Report on Clinical Investigations, 1920-1938. S. G. Scott, London, England.—p. 1.
- Combined Roentgen and Radium Treatment of Carcinoma of Cervix. R. Dresser, J. V. Meigs and J. C. Rude, Boston.—p. 17.
- Roentgen Diagnosis and Therapy of Retropharyngeal Adenitis. R. R. Rathbone, Washington, D. C.—p. 25.
- Roentgen Diagnosis of Dermoid Cysts of Ovary in Absence of Calcification. S. A. Robins and G. White, Boston.—p. 30.
- Fluorography: Photography of Fluorescent Image. I. S. Hirsch, New York.—p. 45.
- Effect of Peptic Ulcer in Cholecystography. M. Feldman, Baltimore.—p. 58.
- Congenital Synostosis of Cervicothoracic Vertebrae (The Klippel-Feil Syndrome). A. M. Rechtman and M. T. Horwitz, Philadelphia.—p. 66.
- Osteopetrosis Associated with Hodgkin's Disease: Review of Literature and Report of Case. H. Herscher and J. J. Stein, Hines, Ill.—p. 74.
- Studies of Human Nervous and Related Tissue by Roentgen Ray Diffraction Method and Petrographic Microscope. L. Reynolds, K. E. Corrigan and Henrietta Hayden, Detroit.—p. 81.
- Production of Radioactive Substances and Neutron Rays. F. N. D. Kurie, Bloomington, Ind.—p. 107.

American Review of Tuberculosis, New York

41:1-142 (Jan.) 1940

- Evaluation of Respiratory Function. W. K. Whitehead and A. T. Miller Jr., Northville, Mich.—p. 1.
- Clinical Studies in Asbestosis. M. J. Stone, Boston.—p. 12.
- *Intrapleural Pneumonolysis: Management of Patient. H. F. Newton, Waltham, Mass.—p. 22.
- Accidents and Complications of Artificial Pneumothorax. P. M. Matull and F. L. Jennings, Oak Terrace, Minn.—p. 38.
- Acute Abdomen During Pneumothorax Therapy. R. H. Bennett and B. Burbank, Brooklyn.—p. 50.
- Purified Protein Derivative: Its Isolation from Old Tuberculin and Fractionation of Residue. Florence B. Seibert and Emma H. DuFour, Philadelphia.—p. 57.
- Intoxication in Tuberculosis. H. J. Corper and M. L. Cohn, Denver.—p. 71.
- *Chronic Nonspecific Pulmonary Disease: I. Radiographic Diagnosis of Bronchiectasis. P. M. Andrus, London, Ont.—p. 87.
- Id.: II. Pathogenesis of Bronchiectasis. P. M. Andrus, London, Ont.—p. 99.
- Id.: III. Classification. P. M. Andrus, London, Ont.—p. 104.

Intrapleural Pneumonolysis.—Newton treated 146 consecutive patients requiring intrapleural pneumonolysis. The number of pneumonolyses performed was 182. Consideration of a patient for the operation depends on the presence of an incomplete pneumothorax of from one to six months in which collapse and rest of the diseased lung is prevented by pleural adhesions. In 128 cases, or 87.6 per cent, there was evidence of probable healing of the lung after pneumonolysis. The author believes that the electrosurgical technic is preferable and safer in experienced hands than the galvanocautery method. The scope of operable adhesions may be widened by its use and risk of complications diminished. Multiple stage intrapleural pneumonolysis is wiser in serious risk cases. The risk of serious operative and postoperative complications in cases in which adhesions are of such size and attachment as to make the risk of damage to lung or serious hemorrhage probable contraindicates intrapleural pneumonolysis.

Chronic Bronchiectasis.—Andrus describes four roentgenologic "cardinal signs" of bronchiectasis: generalized increase in density of the pulmonary markings, ring shadows, displacement of organs and chronic pneumonia. He believes that the presence of any one of these signs warrants a suspicion of bronchiectasis. When two of these "cardinal signs" are well established, such suspicion is greatly enhanced. The presence of three or more of these shadow changes warrants a diagnosis of bronchiectasis, ranging from probable to presumptive or positive, according to the development of the shadows and the clinical associations.

Annals of Internal Medicine, Lancaster, Pa.

13:1105-1284 (Jan.) 1940

- *Parenteral Sulfapyridine: Intravenous Use of Sodium Sulfapyridine and Report of Clinical and Laboratory Observations on Use of Glucose-Sulfapyridine Solution. M. Finland, F. C. Lowell, W. C. Spring Jr. and F. H. L. Taylor, Boston.—p. 1105.
- Treatment of Lobar Pneumonia with Sulfapyridine and Sodium Sulfapyridine: Effective Blood Levels. T. J. Abernethy, H. F. Dowling and C. R. Hartman, Washington, D. C.—p. 1121.
- Experiences in Treatment of Lobar Pneumonia. L. D. Thompson, J. C. Edwards and C. L. Hoagland, St. Louis.—p. 1138.
- *Studies in Peripheral Vascular Disease: I. Intravenous Calcium in Occlusive Vascular Disease. H. S. Weichsel, New York.—p. 1150.
- Independent versus Interconnected Time Marking System Employed in Electrocardiographs. J. B. Wolfe, Philadelphia.—p. 1160.
- Thrombosis of Abdominal Aorta: Report of Four Cases Showing Variability of Symptoms. H. C. Lueth, Evanston, Ill.—p. 1167.
- Studies in Dystrophia Myotonica: IV. Myotonia: Its Nature and Occurrence. A. Ravin and J. J. Waring, Denver.—p. 1174.
- *Cardiovascular Effects of Large Doses of Metrazol in Schizophrenia. E. Messinger and N. Moros, Northport, Long Island, N. Y.—p. 1184.
- Actinomycosis: New Species, Pathogenic for Man. G. C. H. Franklin, Fort Leavenworth, Kan.—p. 1205.
- Pathogenesis of Hemorrhage in Artificially Induced Fever. S. J. Wilson and C. A. Doan, Columbus, Ohio.—p. 1214.
- Parasitology: Round Table Discussion. E. C. Faust, New Orleans.—p. 1230.

Parenteral Sulfapyridine.—Finland and his associates prepared a dextrose-sulfapyridine solution for intravenous and subcutaneous injection. Eighteen patients were suffering from severe acute infections (pneumonia, meningitis, peritonitis, gonorrheal (?) arthritis) and the injections were given as a preliminary to oral sulfapyridine therapy. In two cases the injections were followed by specific serum therapy. The three patients who were not severely ill were the subjects of comparative studies on sulfapyridine and related compounds given by various routes. Sterile physiologic solution of sodium

chloride was used as the diluent. The amounts of the drug in each injection varied from 2.5 to 5 Gm. It was usually given slowly diluted to 1 per cent. The drug appeared within fifteen minutes in the urine. In the spinal fluids the concentration of the drug up to four hours after an injection was only one half or less than that of the blood. The drug appeared rapidly in the stomach contents and was found there in higher concentrations than in the blood. Reactions from the injections were usually of minor importance considering the severity of the cases treated. In one case convulsions during the injection were rapidly followed by collapse and death, and in a second the injections may have contributed to the early onset of pulmonary edema. None of the patients with typical pneumonia showed definite improvement before oral sulfapyridine therapy was begun. The observations suggested to the authors that the effects of the dextrose solution were not as striking as or equivalent to those from corresponding amounts of sulfapyridine or of its sodium salt orally.

Intravenous Calcium in Occlusive Vascular Disease.—Weichsel injected calcium salts intravenously in cases of occlusive vascular disease. Recordings of pulse amplitude before and after injection were made in thirty of these with the Tycoos recording oscillogram. In other cases, observations were made with the Pachon-Boulitte oscillogram. Both instruments showed an appreciable augmentation of the pulse amplitude in a considerable number of cases. The most striking phenomena, however, were relief from pain and increased ability on the part of the patients to walk. This needed explanation. The general flush and the feeling of warmth after the infusion of calcium salts lead one to believe that superficial vessels are being dilated. This impression is strengthened by the sensation of heat in an extremity that previously was cold for months or years because of deficient circulation. The author states that his observations tend to support the view that calcium stimulates the parasympathetic. The author has not seen either thrombosis or severe toxic response in thousands of injections, other than the flush or a slight nausea. Clinically, relief from pain lasts about twenty-four hours, later becoming semipermanent as treatment is continued. Night cramps and rest pain have been consistently relieved. Previously cold extremities become warm again. Patients generally return of their own volition for treatment after the first course is over. It is not uncommon for patients to remain relieved for as much as two years at a time. Calcium gluconate was used at first. The method now used is to add to an infusion of physiologic solution of sodium chloride the required amount of a 50 per cent stock sterile solution of calcium chloride. This is done after the injection is started with the physiologic solution of sodium chloride to be sure that the venipuncture is clean. A 300 cc. pyrex arspenamine tube is used, and glass Luer slip connectors show by reflux of blood when the vein has been entered. Because of the synergism of calcium and digitalis, no digitalized patient should be given calcium. Death may result. All patients received 2 Gm. of calcium chloride once a week for twelve weeks. Claudication distances were materially and consistently increased after treatment. Ulcers were healed with this treatment alone.

Cardiovascular Effects of Large Doses of Metrazol.—Messinger and Moros list changes in the physical signs, blood pressure and electrocardiograms of fourteen men receiving metrazol alone as well as metrazol during the course of insulin hypoglycemia. The metrazol injections as a rule induced a transitory mild to moderate acceleration of cardiac rate (from ten to thirty beats per minute) and at times transitory cardiac irregularities most often of the type of auricular extrasystoles, and sinus arrhythmia, with ventricular extrasystoles more rarely. No instance of auricular fibrillation, although this has been reported by another investigator (Hadorn), has been observed by the authors. Patients who are "sensitive" or "have been sensitized" (by previous treatment with insulin) may show temporary signs of aortic dilatation phenomena, analogous to the known effects of a mild hyperadrenalinemia. Except in such "sensitized" patients, who had electrocardiograms possibly indicating a slight tendency toward diminished coronary oxygenation, the electrocardiograms after convulsions invariably indicated either no change or improved coronary oxygenation, associated with the more vigorous heart action.

Archives of Ophthalmology, Chicago

23: 1-236 (Jan.) 1940

- American Ophthalmological Society: Retrospect of Seventy-Five Years. H. Friedenwald, Baltimore.—p. 1.
- Exophthalmos, Without Pulsation, Due to Arteriovenous Aneurysm: Report of Case. S. S. McNair, Jackson, Miss.—p. 22.
- Investigation of Experimental Cataracts in Albino Rat: Clinical Implications. A. M. Yudkin and Harriet A. Geer, New Haven, Conn.—p. 28.
- Course in Certain Cases of Atrophy of Optic Nerve with Cupping and Low Tension. A. Knapp, New York.—p. 41.
- *Interstitial Keratitis Caused by Specific Sensitivity to Ingested Foods. A. M. Dean, F. W. Dean and G. R. McCutchan, Council Bluffs, Iowa.—p. 48.
- New Method of Applying Radon Seeds for Ocular Disorders. J. Waldman, Philadelphia.—p. 55.
- Certain Retinopathies Due to Changes in Lamina Vitrea. S. R. Gifford and Beulah Cushman, Chicago.—p. 60.
- *Role of States of Anxiety in Pathogenesis of Primary Glaucoma. M. J. Schoenberg, New York.—p. 76.
- Psychosomatic Interrelations: Their Therapeutic Implications in Glaucoma. M. J. Schoenberg, New York.—p. 91.
- The Leland Refractor: Method for Refraction Under Binocular Conditions. S. van Wien, Chicago.—p. 104.
- Ocular Leprosy in the United States: Study of 350 Cases. J. J. Prendergast, St. Paul.—p. 112.
- Exfoliation of Lens Capsule (Glaucoma Capsularis): Forty Cases of Exfoliation. R. Irvine, Los Angeles.—p. 138.
- Method of Ultra Close-Up Photography in Ophthalmology. R. Irvine and R. L. Stimson, Los Angeles.—p. 161.
- Visual Hallucinations and Their Neuro-Optical Correlates. L. M. Weinberger and F. C. Grant, Philadelphia.—p. 166.

Interstitial Keratitis and Food Allergy.—The Deans and McCutchan encountered six persons with interstitial keratitis who presented a characteristic appearance and who were relieved by removing certain foods from their diet. In all six cases the ingestion of at least one food would reproduce clinical symptoms after its withdrawal from the diet resulted in relief of clinical symptoms. The disease commences with slight irritation, mild discomfort, lacrimation and redness. These symptoms continue for weeks, often with remissions, but generally become more and more severe. They fail to respond to local treatment. After the symptoms have continued for some weeks and the process has involved the central portion of the cornea, vision becomes slightly hazy. The slit lamp shows faint, irregular, gray or yellowish gray interstitial opacities in the cornea, at first localized in one quadrant. Loops of scleral vessels soon develop deep in the corneal stroma toward the lesions. As the disease progresses, the opacities increase in number and in density, extending to all portions of the cornea. Scar tissue invades the stromal layers. Lesions rarely break through the anterior epithelium of the cornea to produce ulceration. This condition is similar to that of "recurrent vascular keratitis of unknown origin" (Doggart, 1931). Specific treatment is the removal from the diet of all offending foods, which are ascertained by history, elimination or cutaneous test. When this is done the ciliary injection and pain disappear in forty-eight hours. Opacities which are not escharotic gradually lessen in depth; otherwise the process is arrested. The vessels in the corneal stroma continue to function for a long time, although their diameters seem to be lessened. If the sensitizing food is again ingested after the process is arrested, symptoms reappear within twenty-four hours. The disease was reproduced only twice, as no patient would submit to further experimentation.

Primary Glaucoma.—Schoenberg contends that the eyes of some patients with primary glaucoma register states of anxiety just as those of other persons with glaucoma record changes in weather, poor illumination, poorly balanced diets, cardiovascular disturbances, acute febrile diseases and sudden increases in blood pressure. States of anxiety cause a widespread and more or less intense disturbance of the physiologic processes throughout the entire body. The ocular disturbances occurring during acute states of emotion are increase in the size of the pupils, enlargement of the interpalpebral fissure, bulging of the eyes, hypersecretion of the lacrimal glands and spasm of the retinal arteries (in older patients). Most of these manifestations are similar to those appearing after a sudden and large increase of epinephrine in the blood stream. It is well known that under conditions of emotional stress there is a marked increase of epinephrine-like substances in the blood and tissues. The autonomic nervous system and the endocrine glands reach every organ and tissue in the body. Evidence shows that the two parts of the autonomic nervous system

(the sympathetic and parasympathetic) are out of balance within the glaucomatous eyes and that states of anxiety have a different effect on glaucomatous eyes than on normal eyes. The following are some evidences for the first statement: 1. The power of accommodation is diminished and there is a tendency for the pupils to be somewhat dilated (underaction of the parasympathetic system). 2. Epinephrine hydrochloride dilates the pupil of a glaucomatous eye when instilled in the fornix but it does not do so in a normal eye. 3. The pupils of glaucomatous eyes usually need a stronger solution of pilocarpine for contraction (showing that the parasympathetic innervation of the sphincter pupillae is hypotonic). 4. Atropine in the usual doses increases appreciably the intra-ocular pressure of the glaucomatous eye and not of the normal eye. 5. Pilocarpine and physostigmine salicylate reduce the ocular tension in certain glaucomatous eyes, while the tension in normal eyes remains unaffected. 6. Drugs with a specific action on the autonomic nervous system also have a specific action on glaucomatous eyes. 7. Emotional upsets, febrile diseases and sleeplessness have a strong unbalancing influence on the function of the autonomic nervous system and also tend to increase the ocular tension. Proving the effect of states of anxiety on glaucomatous eyes, the following facts are cited: 1. The author's patients presented such evidence. 2. The ophthalmologic literature contains reports (vague and meager, though they are) of attacks of acute glaucoma following violent emotions. 3. In some cases of glaucoma a recrudescence of the condition is attributable to states of anxiety. 4. Many patients, when permitted and encouraged to talk, have described minor or major attacks of glaucomatous crises during or following states of anxiety. 5. There is no case on record of an attack of glaucoma in a normal eye following an emotional upset.

Archives of Otolaryngology, Chicago

31:1-230 (Jan.) 1940

- Vocal and Verbal Syndromes: Their Rhinolaryngologic Significance. J. S. Greene, New York.—p. 1.
Defects in Speech in Relation to Defects in Hearing. I. W. Voorhees, New York.—p. 7.
Simple Treatment for Defects of Singing and of Speaking Voice. W. Mithoefer, Cincinnati.—p. 16.
Voice After Direct Laryngoscopic Operations, Laryngofissure and Laryngectomy. C. L. Jackson, Philadelphia.—p. 23.
Defective Speech in Relation to Defective Hearing. M. A. Goldstein, St. Louis.—p. 38.
Relation of Allergy and Tonsillectomy in Children: Incidence of Respiratory Allergy in Cases of Routine Tonsillectomy. F. K. Hansel, St. Louis, and C. S. Chang, Peiping, China.—p. 45.
Alterations in Nasal Function Due to Anatomic Variations of Nares. A. A. Cinelli, New York.—p. 53.
Method for Reconstruction of Postauricular Defects. G. R. O'Brien, Brooklyn, and W. B. Slaughter, Omaha.—p. 65.
Nature of Vitamin B and Its Components, with Special Reference to Nerve Deafness. C. A. Veasey Jr., Spokane, Wash.—p. 74.
Reconstruction After Radical Operation for Osteomyelitis of Frontal Bone: Experience in Eighteen Cases. V. H. Kazanjian and J. M. Converse, Boston.—p. 94.
Galvanic Reaction in Guinea Pigs: II. Reaction Following Section of Eighth Nerve. A. R. Buchanan and Laura D. Ladd, University, Miss.—p. 113.
Id.: IV. Reaction in Animals with Unilateral Lesions in Brain Stem. A. R. Buchanan, University, Miss.—p. 120.
Argyria Resulting from Intranasal Medication: Clinical and Experimental Study. B. L. Bryant, Los Angeles.—p. 127.
Interstitial Emphysema of Lung with Spontaneous Pneumothorax and Subcutaneous Emphysema: Demonstration of Air in Septums of Human Lung. Vera B. Dolgopel and M. E. Stern, New York.—p. 140.
Benign Tumors of Bronchi, with Special Reference to Vascular Adenoma. H. L. Laff, Denver.—p. 148.
Diplacusis: Localizing Symptom of Disease of Organ of Corti: Theoretical Considerations, Clinical Observations and Practical Application. G. E. Shambaugh Jr., Chicago.—p. 160.

Vitamin B and Nerve Deafness.—The possible relation between deficiency of vitamin B and at least some forms of nerve deafness, pointed out by Selfridge, prompted Veasey to review the literature (up to 1938) on vitamin B, from which he finds that a vitamin B deficient person may have symptoms referable to the nervous, vascular or gastrointestinal system, the endocrine glands or the organs of special sense. The author cites seven cases of impaired hearing for the treatment of which he used vitamin B. The results suggest that there is a possibility of helping some persons by this means but that at the present time there are no means of selecting the patients who may be improved.

Argyria from Intranasal Medication.—Bryant cautions that argyria can result from the use of silver-containing intranasal medication. A 100 per cent increase in such cases reported occurred during a recent period of five years. Walsh and Cannon observed that all their rabbits treated intranasally with 5 per cent mild protein silver and neosilvol showed changes in the lungs, consisting of edema, necrosis, desquamation of septal cells and bronchopneumonic lesions. These changes were more marked when the animal had the snuffles. When to these observations is added the real danger of the production of argyrosis, it seems that a clear case against the intranasal use of silver preparations has been established. Measures should be taken to warn the public of the danger of the production of argyria by long-continued self medication with silver preparations.

Archives of Pathology, Chicago

29:1-152 (Jan.) 1940

- Lymphoid Tumors in Mice Receiving Estrogens. W. U. Gardner, A. Kirschbaum and L. C. Strong, New Haven, Conn.—p. 1.
Production of Internal Tumors with Chemical Carcinogens. H. P. Rusch, C. A. Baumann, Madison, Wis., and G. L. Maisen, St. Louis.—p. 8.
Disease of Liver in Hyperthyroidism. J. M. Shaffer, New York.—p. 20.
Chemistry of Atherosclerosis: I. Lipid and Calcium Content of Intima and of Mediums of Aorta With and Without Atherosclerosis. S. Weinhouse and E. F. Hirsch, Chicago.—p. 31.
Morphogenesis of Extraskelletal Osteogenic Sarcoma and Pseudo-Osteosarcoma. J. S. Binkley and F. W. Stewart, New York.—p. 42.
Blood Pressure in Experimental Nephritis Produced by Injection of Nephrotoxic Serum. C. F. Kay, Baltimore.—p. 57.
*Pathologic and Histologic Changes Following Oral Administration of Sulfapyridine, with Short Note on Sodium Sulfapyridine. W. Antopol, Newark, N. J., and H. Robinson, Rahway, N. J.—p. 67.
Plastic Studies in Abnormal Renal Architecture: V. Parenchymal Alterations in Experimental Hydronephrosis. K. C. Strong, Brooklyn.—p. 77.

Microscopic Changes After Sulfapyridine.—Antopol and Robinson observed concretions in certain animals after the administration of a large single dose of sulfapyridine, but the results were more striking after repeated doses on successive days. From their studies the authors cannot conclude whether the precipitation of the acetylated sulfapyridine in the urine is always primary or whether it is dependent on initial degenerative changes in the renal parenchyma or on a combination of the two. With the oral administration of sodium sulfapyridine, smaller doses were necessary for urolith formation in the rat, rabbit and monkey. Histologically the degenerative changes in the kidney were more pronounced than those from sulfapyridine. When the drug was administered rectally, a hemorrhagic reaction with some necrosis of the mucosa was frequently encountered.

Archives of Physical Therapy, Chicago

21:1-64 (Jan.) 1940

- Benefits of Exercise. H. G. Hadley, Washington, D. C.—p. 5.
Mecholyl and Histamine Effects on Peripheral Circulation and Relief of Arthritic Pain. A. Cohen and H. Rosen, Philadelphia.—p. 12.
Modified Method for Application of Short Wave Diathermy. Martha Brunner and F. H. Krusen, Rochester, Minn.—p. 16.
After-Care of Fractures, with Special Reference to Delayed Union and Sudeck's Atrophy. H. H. Jordan, New York.—p. 25.
Irrigation of Colon. J. S. Hibben, Pasadena, Calif.—p. 33.
Physical Therapy Principles of Periarthritis of Shoulder. J. I. Kendrick, Cleveland.—p. 41.

Connecticut State Medical Journal, Hartford

4:1-58 (Jan.) 1940

- Industrial Poisons—Physiologic and Clinical Considerations. G. H. Gehrmann, Wilmington, Del.—p. 3.
Legg-Perthes Disease, with Particular Regard to Treatment. M. M. Pike, Hartford.—p. 5.
Present Trend in Treatment of Progressive Deafness. N. Canfield, New Haven.—p. 12.
Treatment Procedures for Cancer of Uterus Advised by the Connecticut Tumor Clinics. J. R. Miller, Hartford.—p. 16.
Dysmenorrhea. C. E. Johnson, New Haven.—p. 20.
Further Studies in Therapy of Acute Anterior Poliomyelitis. C. L. Thenele and M. S. Hirschberg, Hartford.—p. 25.

Delaware State Medical Journal, Wilmington

12:1-18 (Jan.) 1940

- The Work of the Haskell Laboratory of Industrial Toxicology. J. H. Foulger, Wilmington.—p. 1.
Cancer of Skin. I. Zugerman, Philadelphia.—p. 4.

Illinois Medical Journal, Chicago

77: 1-96 (Jan.) 1940

- Radium Treatment of Cancer of Cervix Uteri. F. E. Simpson, collaborators J. E. Breed and J. S. Thompson, Chicago.—p. 23.
- Kraurosis and Leukoplakia of Vulva. J. I. Brewer, Chicago.—p. 26.
- Diagnosis of Backache. S. J. Lang, Evanston.—p. 32.
- Surgical Technic for Repair of Extensive Vesicovaginal Fistula, Following Total Hysterectomy. E. Jonas and A. Dick, Chicago.—p. 35.
- Upper Respiratory Revenge of the Allergic Child. I. H. Tumpeer, Chicago.—p. 37.
- Control of Syphilis in Pregnant Women. H. M. Soloway, Springfield.—p. 44.
- Laboratory Studies in Huntington's Chorea. E. I. Falstein and T. T. Stone, Chicago.—p. 47.
- *Use of Picrotoxin in Acute Barbiturate Poisoning. C. W. Eisele and H. W. Brosin, Chicago.—p. 49.
- Tularemia and Its Treatment with Serum. A. J. Toman, Chicago.—p. 53.
- Treatment of Hemorrhage from Gastrointestinal Tract. A. Brunschwig, Chicago.—p. 55.
- Pathology and Treatment of Otitic and Rhinogenic Meningitis. H. Brunner, Chicago.—p. 57.
- Immunizations. R. C. Farrier, East St. Louis.—p. 63.
- Chorea Gravidarum: Report of Case Recurring in Three Successive Pregnancies: Klippel-Feil Syndrome in the Last Newborn. Yetta Scheffel, Chicago.—p. 67.
- The Doctor Looks at Hospitalization Insurance. T. J. Byrne Jr., Chicago.—p. 71.
- School Health in Illinois. H. H. Boyle, S. C. Henn, Chicago; J. E. Carey, Joliet, and Alvah L. Newcomb, Wilmette.—p. 76.
- False Positive Blood Serologic Tests for Syphilis Following Vaccination for Variola. R. D. Bernard, Chicago.—p. 78.
- Occupational Dermatoses Under the Illinois Workmen's Occupational Diseases Act. H. R. Foerster, Milwaukee.—p. 79.
- Vertigo as Primary Manifestation in Anxiety Neurosis. Adelaide M. Johnson, Chicago.—p. 86.

Picrotoxin for Acute Barbiturate Poisoning.—Eisele and Brosin report two cases of barbiturate poisoning treated with picrotoxin. Although the amounts of barbiturate ingested were not massive, the lapse of time between the ingestion of the barbiturate and its discovery was ample for complete absorption of the drug to take place. The symptoms (deep coma, absence of reflexes, flaccidity of musculature and cyanosis) pointed to a serious poisoning in both cases. In both cases, picrotoxin repeatedly produced definite awakening phenomena which subsided on withdrawal of the drug; therefore it, with other supportive measures, was continued until recovery ensued. A complete abortion of a three months pregnancy occurred in the first case shortly after the onset of picrotoxin therapy. It is debatable whether the abortion resulted from the treatment or from the barbiturate poisoning itself. However, the experimental work of Kunisho suggests that the picrotoxin may have been the cause of the abortion; Kunisho found that small doses of picrotoxin always stimulated the uterus of the rabbit. Bronchopneumonia is a frequent complication of barbiturate poisoning. Picrotoxin, by shortening the period of coma, should eliminate or mitigate this complication in many instances.

Iowa State Medical Society Journal, Des Moines

30: 1-44 (Jan.) 1940

- Diagnosis and Treatment of Vitamin Deficiencies. L. F. Barker, Baltimore.—p. 1.
- Treatment of Varicose Veins at the University Hospitals. G. O. Dean, Iowa City.—p. 8.
- Operation for Ununited Fracture of Neck of Femur. L. J. Miltner, Davenport.—p. 9.
- Puerperal Inversion of Uterus. E. J. Butterfield, Dallas Center.—p. 12.
- Roentgen Examination of Pelvis in Pregnancy. A. E. Perley, Waterloo.—p. 14.

Johns Hopkins Hospital Bulletin, Baltimore

66: 1-70 (Jan.) 1940

- Metabolic Studies and Therapy in Case of Nephrocalcinosis with Rickets and Dwarfism. F. Albright, W. V. Consolazio, F. S. Coombs, H. W. Sulikowitch and J. H. Talbott, Boston.—p. 7.
- *Medical and Surgical Treatment of Severe Bronchial Asthma. E. L. Keeney, Baltimore.—p. 34.
- Action of Quinine Methochloride on Neuromuscular Transmission. A. M. Harvey, London, England.—p. 52.
- Chromosomal Nature of Nucleoli. W. H. Lewis, Baltimore.—p. 60.

Treatment of Severe Bronchial Asthma.—Keeney believes that the treatment of patients with severe bronchial asthma is simplified by classifying the disease into three groups: severe acute bronchial asthma, intractable asthma (status asthmaticus) and severe chronic bronchial asthma. Patients with severe acute asthma should first receive from 0.3 to 0.5 cc. of epinephrine hydrochloride (1:1,000). Such a dose should be repeated every fifteen minutes until four doses have been administered or until relief is apparent. To prevent

recurrence of asthma, an intramuscular injection of from 0.75 to 1 cc. of epinephrine-in-oil should follow. One of the barbituric acid derivatives may be given as a sedative. An injection of from 0.3 to 0.5 cc. of Schlesinger's solution (0.000125 Gm. of scopolamine hydrochloride, 0.01 Gm. of morphine hydrochloride and 0.015 Gm. of ethylmorphine hydrochloride) is permissible if the patient is badly in need of rest. Epinephrine therapy is best for hypertensive patients with severe asthma. Patients with intractable asthma fail to obtain relief from the usual epinephrine preparations. They are not "epinephrine fast." The intravenous injection of 100 cc. of a 50 per cent solution of sucrose to which has been added 0.5 cc. of epinephrine hydrochloride (1:1,000) or the injection of 0.48 Gm. of aminophylline diluted in 10 cc. of physiologic solution of sodium chloride may give temporary relief. The continuous or intermittent inhalation of an atmosphere of 100 per cent oxygen or of 80 per cent helium and 20 per cent oxygen is a physiologically sound therapeutic measure. To improve the cardiac action, digitalization should be carried out in from twenty-four to forty-eight hours and then a maintenance dose should be provided until the patient is free from asthmatic symptoms. From 60 to 120 cc. of a mixture of equal parts of ether and olive oil may be instilled rectally to induce sleep. Patients with severe chronic bronchial asthma require frequent daily and nocturnal injections of epinephrine hydrochloride (1:1,000). Epinephrine-in-oil intramuscularly requires fewer injections and is followed by longer symptom-free periods. The value of intratracheal injections of iodized oils is generally overrated.

Journal of Allergy, St. Louis

11: 109-224 (Jan.) 1940

- Antigenic Studies by Dale Test: II. Antigenicity of House Dust. S. F. Hampton and A. Stull, New York.—p. 109.
- Ionic Transmission Method for Testing with Allergens. L. O. Dutton, El Paso, Texas.—p. 130.
- Significance of Cottonseed Sensitiveness. H. S. Bernton, J. R. Spies and H. Stevens, Washington, D. C.—p. 138.
- Intrinsic Asthma. F. M. Rackemann, Boston.—p. 147.
- Allergic Syndromes in Absence of Allergens: Presidential Address. H. L. Alexander, St. Louis.—p. 163.
- Immunologically Altered Skin Reactivity in Nonatopic Persons. L. W. Hill, Boston.—p. 170.

Journal of Bone and Joint Surgery, Boston

22: 1-260 (Jan.) 1940. Partial Index

- Interpretation of Sciatic Radiation and Syndrome of Low Back Pain. A. Steindler, Iowa City.—p. 28.
- *Tetanus and Lesions of Spine in Childhood. H. F. Dietrich, Rolla G. Karsner and S. F. Stewart, Los Angeles.—p. 43.
- *Clay Shoveler's Fracture. R. D. M. Hall, Perth, Western Australia.—p. 63.
- Surgical Correction of Talipes Cavus Deformities. Alvia Brockway, Los Angeles.—p. 81.
- Ununited Fracture of Neck of Femur Treated by Aid of Bone Graft. M. S. Henderson, Rochester, Minn.—p. 97.
- Dislocation of Elbow and Its Complications: Simple Technic for Excision of Elbow. M. G. Kini, Vizagapatam, South India.—p. 107.
- Surgical Treatment of Acute Subacromial Bursitis. W. P. Bartels, Hempstead, N. Y.—p. 120.
- Lock-Bolt Fixation of Fractures of Femoral Neck and of Intertrochanteric Fractures. E. W. Cleary, Burlingame, Calif., and G. M. Morrison, San Mateo, Calif.—p. 125.
- Prevention of Deformity of Spine by Vertebral Fusion. S. L. Haas, San Francisco.—p. 157.
- Gonorrheal Arthritis: Proposed Plan of Sulfanilamide Therapy. O. S. Culp and M. C. Cobey, Baltimore.—p. 185.

Tetanus and Lesions of Spine in Childhood.—Dietrich and his colleagues state that during the last eighteen years at the Children's Hospital the mortality from tetanus has dropped from 80 to 8 per cent. Of the surviving patients who have been examined, 69 per cent showed lesions in the thoracic spine. During the years 1921 to 1933 the plan of treatment was débridement and the injection of large amounts (from 15,000 to 100,000 units) of tetanus antitoxin locally, intramuscularly, intravenously and intrathecally. Of the fifteen patients in this group twelve died, eleven deaths occurring within fourteen hours of the institution of treatment. In every instance the disease picture was changed from one of tetanus, with relatively low temperature and pulse rate and clear sensorium, to a condition resembling grave bulbar involvement. The three patients who recovered showed similar but less serious reactions. After short periods of grave uncertainty the reaction subsided suddenly but the tetanus improved more slowly. One of these patients had such severe reactions following each intraspinal injection of antitoxin that the outcome after each injection was questionable. Post-

mortem studies of four of the patients who died suddenly showed marked medullary and cerebral edema and mild to moderate inflammatory changes. Thus it appears that the hypersensitive central nervous system of the patient with tetanus cannot withstand the added insult of a sterile meningitis or increasing intracranial pressure. Only one of the thirteen patients treated from 1933 to the present time died. This death occurred three hours after the first administration of 20,000 units of antitoxin intravenously. Eight of these twelve patients were not given intrathecal injections of serum. The remaining four had severe reactions after the administration of serum intraspinally, but somehow they survived a few critical hours. The temperature and pulse rate then fell rapidly, although tetanic activity continued. The authors feel that these dramatic elevations and subsequent rapid falls of temperature and pulse rate were entirely dissociated from the course of the tetanus. The reactions always occurred after treatment and subsided long before the tendency to severe tetanic convulsions had disappeared. Two of the surviving patients who were given intravenous but no intrathecal injection of serum showed similar severe reactions, so it is impossible to ascribe all of these "bulbar crises" to sterile meningitis. In one of the latter cases, when death seemed imminent, hypertonic sucrose solution was given intravenously in the belief that the reaction was due to cerebral edema. A dramatic improvement followed within a few hours. Four of the surviving patients who received only local and intramuscular injections of serum were, with one exception, the only patients who did not have a frightening reaction following treatment. Every patient in this group received large doses of sedatives: amytal, avertin with amylene hydrate and, more recently, seconal (a barbitol preparation). The authors conclude that between 1921 and 1933 something was done that precipitated critical reactions and death. In every instance reactions followed either intrathecal or intravenous administration of antitoxin. Therefore it seems that the intrathecal administration of tetanus antitoxin for juvenile tetanus should be discontinued because of the severe reactions (sterile meningitis, cerebral edema and death) which follow its use. It is a frequent cause of death of children so treated. With the increasing recovery rate there has been a marked increase of vertebral deformities. The possibility of preventing some of these by early and vigorous sedation suggests itself. By the time anything can be done for the patient with a vertebral deformity, repair has occurred and the deformity remains. As the condition is practically symptomless, treatment has been found useless.

Clay Shoveler's Fracture.—Hall reports thirteen cases of occupational injury which he terms "clay shoveler's fracture." The history of the accident is the same in practically all cases. The laborer (digging drains in clay soil) throws up a shovelful of clay usually from 10 to 15 feet, the clay sticks to the shovel and the worker feels a sudden stab of pain and sometimes hears a crack somewhere between the shoulders and is unable to continue working. It is suggested that the causation of clay shoveler's fracture is closely associated with the origins and actions of the trapezius (middle portion), the rhomboideus major and the rhomboideus minor; the serratus posterior superior acts merely as an accessory to these muscles, for when the worker is in the act of throwing this muscle is probably in full contraction, thus helping to fix the chest. The three possible mechanisms of this fracture are direct muscle violence, reflex muscle contraction and whiplike pull transmitted through the supraspinal ligaments. Early removal of the detached fragments is doubtless the treatment of choice.

Journal of Immunology, Baltimore

35: 1-80 (Jan.) 1940

- Studies on Immunization of Rabbits with Formalinized Vaccine Virus. A. J. Weil and L. S. Gall, Pearl River, N. Y.—p. 1.
Comparison of Acquired Immunity and Species Resistance Based on Cultivation of Virus III in Vitro. J. M. Pearce, Princeton, N. J.—p. 9.
Immunologic Studies of Pollinosis: I. Presence of Two Antibodies Related to Same Pollen-Antigen in Serum of Treated Hay Fever Patients. Mary Hewitt Loveless, New York.—p. 25.
Natural Transmission of Immunity Against Trypanosoma Duttoni from Mother Mice to Their Young. J. T. Culbertson, New York.—p. 51.
Synergistic Effect of Paraffin Oil Combined with Heat Killed Tubercle Bacilli. J. Freund, J. Casals-Ariet and Dorothy Schaefer Genghof, New York.—p. 67.

Journal of Nutrition, Philadelphia

19: 1-104 (Jan.) 1940. Partial Index

- Adequacy of a Milk Diet for the Rat. L. R. Richardson and A. G. Hogan, Columbia, Mo.—p. 13.
Prevention of Hyperplasia in Forestomach Epithelium of Rats Fed White Flour. G. R. Sharpless, Detroit.—p. 31.
State of Vitamin A in Liver of Rat After Feeding Various Forms of Vitamin. E. L. Gray, K. C. D. Hickman and Elizabeth F. Brown, Rochester, N. Y.—p. 39.
Quantitative Requirements of Components of Vitamin B Complex for Lactation and Growth of Nursing Young of Albino Rat. B. Sure, with technical assistance of Alethea Beach, Fayetteville, Ark.—p. 57.
Influence of Nitrogen Content of Diet on Calory Balances of Preschool Children. Jean E. Hawks, Jeanne M. Voorhees, Merle M. Bray and Marie Dye, East Lansing, Mich.—p. 77.

Influence of Nitrogen Content of Diet on Calory Balances.—Hawks and her associates observed five preschool children serving as subjects for two long-time balance experiments. In each experiment they received two diets, the first of which contained daily 3 Gm. and the second 4 Gm. of protein per kilogram of body weight. The increase in the protein content of the diets did not change the constant level of calory utilization. The children in each experiment reacted in the same manner, although there were slight differences in the results of the two experiments. The period to period variations for excretory values remained constant on the two diets and the absorption and retention figures varied in the same manner and to the same degree as the intake values. The change from the diet containing 3 Gm. to the one containing 4 Gm. of protein affected the calory balance as follows: 1. It increased the nitrogen content of the excreta, thus increasing the actual number of calories eliminated. 2. It increased the average proportion of the intake calories eliminated from 7.3 to 12 per cent. Thus, subtracting 10 per cent from the intake values to care for excretory losses does not always give accurate results. 3. It reduced the actual number, as well as the percentage, of the intake calories available for body needs, but at the same time it produced greater weight gains in the children.

Journal of Urology, Baltimore

43: 1-248 (Jan.) 1940. Partial Index

- Renal Digestive Reflex. E. Smith and L. Orkin, Montreal.—p. 1.
Silent Nephroma. H. W. Ostrum and J. S. Fetter, Philadelphia.—p. 39.
Ureteropelvic Anastomosis Following Avulsion. A. Hyman and S. F. Wilhelm, New York.—p. 52.
Retroperitoneal Lipofibrosarcoma in Child. H. L. Kretschmer, Chicago.—p. 61.
Wilms Tumor: Report of Three Cases and a Possible Fourth One in Same Family. L. A. Maslow, Chicago.—p. 75.
Further Observations on Use of Insulin-Free Pancreatic Tissue Extract as Aid in Cystoscopic Treatment of Impacted Ureteral Calculi and Spastic Occlusion of Ureter. J. A. Lazarus, New York.—p. 102.
Metastatic Abscess of Prostate Gland. J. Schwartz, New York.—p. 108.
Urethral Resistance in Relation to Vesical Activity. O. R. Langworthy, J. E. Drew and S. A. Vest, Baltimore.—p. 123.
Hydromechanics of Calix Renalis. P. A. Narath, New York.—p. 145.
Conservative Surgery in Management of Hydronephrosis. E. H. Fite, Muskogee, Okla.—p. 177.
Physiology of Bladder. D. K. Rose, St. Louis.—p. 190.
Granular Urethritis in Women. H. M. Spence, Dallas, Texas.—p. 199.
Cryptorchidism: Theory to Explain Its Etiology: Modifications in Surgical Technic: Preliminary Report. N. S. Moore and S. M. Tapper, St. Louis.—p. 204.
Calcium Urolithiasis: Role of Calcium Metabolism in Pathogenesis and Treatment of Calcium Urolithiasis. R. H. Flocks, Iowa City.—p. 214.
Female Pseudohermaphroditism. C. K. Smith and A. L. Stockwell, Kansas City, Mo.—p. 234.
Causes of Dysuria After Prostatic Surgery. R. E. Van Duzen, Dallas, Texas.—p. 245.

Silent Nephroma.—Ostrum and Fetter use the term silent nephroma for a group of far advanced malignant renal neoplasms with extensive metastases which, because of the site of metastases and the absence of urinary signs and symptoms, lead clinicians to suspect structures other than the kidneys as the possible source of disease. They encountered twenty-one such cases in eight years. In all the cases the chief complaints were referred not to the primary source of disease but to extensive metastases of other parts. Hematuria was observed in only three cases. Other complaints so overshadowed the bloody urine that the possible diagnosis of renal tumor was overlooked. Two of the patients presented themselves for medical attention because of painful knee joints. Examination of the chest of one of these patients revealed the presence of pleural effusion for which no explanation could be given and x-ray examination of the knee showed little involvement.

Repeated tapping of the chest was done and the knee was treated by physical therapeutic measures with some improvement. The patient returned at a later date with much increase in the pain and swelling of the knee and increased dyspnea. Repeated examination of the knee revealed an extensive osteolytic malignant lesion of the lower end of the femur. Necropsy showed a large hypernephroma of the right kidney with extensive metastases to the regional nodes, lungs, pleura and lower end of the right femur. Ten patients presented themselves with complaints of abdominal pain of various types and locations. Ten patients complained of various respiratory symptoms either as their cause of distress or in association with other more urgent symptoms. In seven instances the clinical history and physical signs were so suggestive that a diagnosis of advanced pulmonary tuberculosis was made. The authors state that the clinical triad of hematuria, pain and abdominal tumor is by no means essential to suggest disease of the urinary tract. If any one of these three manifestations is observed, a uroentgenographic study is indicated, provided a definite diagnosis is not otherwise made. The occurrence of even a single instance of gross or microscopic hematuria should always be viewed with serious concern. When uroentgenographic studies are performed, a conclusive opinion should not be formulated on the basis of a single examination. In such cases studies should be repeated at intervals.

Kansas Medical Society Journal, Topeka

41:1-44 (Jan.) 1940

- Prognosis and Treatment of Streptococcal Meningitis. F. L. Menehan, Wichita.—p. 1.
Lead Encephalopathy. D. N. Medearis, Kansas City.—p. 5.
The Modern Concept of Diabetes. A. J. Revell, Pittsburg.—p. 8.
Combined Spinal Inhalation Anesthesia for Major Abdominal Operations. P. H. Lorhan and T. G. Orr, Kansas City.—p. 13.
Paralytic Adynamic Ileus. C. E. Partridge, Emporia.—p. 15.
Acquired Atresia of Vagina, Cesarean Section and Retained Lochia; Followed by Severe Late Eclampsia. G. Cowles and C. Robison, Wichita.—p. 17.

Military Surgeon, Washington, D. C.

86:1-96 (Jan.) 1940

- The Medical Service with the Streamlined Division. T. E. Darby and P. E. Zuver.—p. 1.
New Regimental Medical Detachment. R. P. Williams.—p. 9.
Vincent's Infection. W. A. Rose.—p. 26.
Extracts from Notebook of a Medical Inspector. D. P. Penhallow.—p. 36.
Observations of a Medical Officer at the Recent Plattsburg Maneuvers. L. K. Gurjian.—p. 45.
*Treatment of Acute Gonorrheal Urethritis. C. E. Morse and F. G. Hirsch.—p. 53.
Sulfanilamide and Future Medical Military Statistics. F. G. Norbury.—p. 57.

Treatment of Acute Gonorrheal Urethritis.—To evaluate four different methods of treating acute anterior gonorrheal urethritis, Morse and Hirsch treated twenty-five cases by each method: sulfanilamide, sulfanilamide and anterior injections of silver protein, anterior irrigations with silver protein preceded by potassium permanganate irrigations, and daily anterior irrigations with a suspension of colloidal silver. All the patients were seen within five days from the onset of discharge before having any previous treatment and only initial infections were selected. The dosage of sulfanilamide of the first group of patients was 80 Gm. For the first two days 5.33 Gm. was given each day in four divided doses, 4 Gm. for the following two days and then 2.66 Gm. until the entire amount had been taken. The average duration of the disease in these cases was 39.1 days with extremes of from nine to ninety-three days. From the standpoint of complications, 56 per cent had none. Arthritis or epididymitis did not develop in any patient. Prostatitis developed in 8 per cent and the infection extended into the posterior urethra in 36 per cent. The average duration of the disease in the second group was fifty-one days. The extremes were sixteen and ninety-three days. There were no complications in 32 per cent of the cases, the infection in 52 per cent extended to the posterior urethra, epididymitis developed in 12 per cent and prostatitis developed in 4 per cent. The average duration of the disease of the third group of patients was fifty-one days with extremes of from thirty-eight to eighty-two days. The incidence of complications in this group was significantly higher. In only 30 per cent of the

cases was the infection kept localized to the anterior urethra. In 20 per cent the only complication was a posterior urethritis, but in 50 per cent epididymitis or prostatitis developed. The average duration of the disease of the remaining twenty-five patients treated by daily anterior irrigations of a suspension of colloidal silver was 46.9 days, with extremes of eighteen and ninety-six days. Of these cases 64 per cent remained uncomplicated for the duration of the disease, in 24 per cent the disease extended into the posterior urethra and in 4 per cent prostatitis, epididymitis or arthritis developed. The authors' conclusions are that sulfanilamide without supplementary silver irrigations gave the most satisfactory results and that a colloidal suspension of metallic silver is preferable to protein silver preparations in cases in which the use of silver is desirable.

New England Journal of Medicine, Boston

222:41-78 (Jan. 11) 1940

- *Cardio-Omentopexy in Treatment of Angina Pectoris: Report of Two Cases. J. W. Strieder, H. M. Clute and A. Gratzel, Boston.—p. 41.
Acute Pancreatic Necrosis: Clinical Lecture. J. H. Pratt, Boston.—p. 47.
Comparative Study of Tuberculin Patch Test and Standard Intradermal Test (Purified Protein Derivative). R. B. Kerr, Manchester, N. H., and A. L. Winograd, Nashua, N. H.—p. 53.
*Can Infantile Paralysis Be Spread by Bathing in Sewage-Polluted Waters? S. M. Ellsworth, Boston.—p. 55.
Allergy to Tubercle Bacilli as Possible Cause of Acute Pulmonic Consolidation. D. A. Sampson, Philadelphia.—p. 58.
Medical Aspects of Obstetrics. T. R. Goethals, Boston.—p. 60.

Cardio-Omentopexy in Angina Pectoris.—Strieder and his associates review the literature on the revascularization of the ischemic heart. Beck was the first to make an attempt at revascularization of the ischemic heart in the human subject. Using the pectoralis major muscle as a pedicled graft, Beck attempted to bring a new blood supply to the heart in a human subject. O'Shaughnessy, who also experimented on cardiac grafting, used instead of muscle a pedicled omental graft. O'Shaughnessy has thought that the control of postoperative shock is an easier matter following cardio-omentopexy than following Beck's operation. Moreover, cardio-omentopexy is less time consuming and, other factors being equal, the omentum is obviously a better vascularizing agent than is the pectoralis major muscle. Because of these considerations the authors have concluded that cardio-omentopexy, when feasible, is the operation of choice for the establishment of a new blood supply to the heart by surgical means. They have performed it in two cases. In the selection of cases for operation they insist on the fulfillment of several requirements. There must be indisputable evidence of coronary heart disease with angina pectoris. At present the authors insist also that the patient be under 60 years of age and not obese. Serious complications in other organs are contraindications. Patients with marked hypertension and cardiac enlargement are rejected. Furthermore, the authors are of the opinion that patients who give evidence of congestive failure are not suitable candidates for operation. They describe the technic of cardio-omentopexy and review the postoperative course. They stress that the technic of this operation must be seriously concerned with the prevention of postoperative diaphragmatic hernia, as well as with the attachment of omentum to the heart. They report two cases in which they resorted to cardio-omentopexy. They think that many more patients must be operated on before any sweeping conclusions can be drawn, but they believe that the principle of revascularization is sound.

Infantile Paralysis Spread by Sewage-Polluted Waters.—Ellsworth says that in 1935 Massachusetts was visited by an epidemic of infantile paralysis. Fall River, with 114 cases reported, had the highest incidence of any city or town. Having but recently observed the effect of sewage on the bathing beaches at Fall River, the author wondered whether this pollution had any effect on the high incidence of infantile paralysis in that city. It is his conviction that there is sufficient presumptive evidence to warrant further investigation and research. He formulates the argument as follows: Since epidemic infantile paralysis occurs almost invariably during the summer, it is reasonable to assume that the disease may be spread not only by direct or indirect personal contact but also by some agency which is effective during the warm summer months. From the evidence in Massachusetts, the incidence of the disease during

epidemics is generally highest in communities situated along the seacoast or along rivers the waters of which are subject to sewage pollution. It has been possible to produce the disease in monkeys from the virus obtained from human stools of a case of abortive poliomyelitis as long as twenty-five days after the onset of the disease. It has also been shown that the virus in refrigerated human stools remains viable for at least ten weeks. For every recognized case there are apparently many unrecognized cases by which infection can be spread. During epidemics, and probably at other times, the virus from active cases or from carriers is undoubtedly present in the sewage of an affected community. Infection by way of the olfactory nerves is possible, and it appears probable that this is a common way of contracting the disease. Given a sufficient concentration of the virus in sewage-polluted water, it is conceivable that infection can be caused by the admission of such water into the nasal passages of a bather. While the possibility of infection by bathing in sewage-polluted water has been considered in the past and tentatively dismissed for lack of evidence, sufficient additional knowledge has been accumulated in recent years concerning infantile paralysis to warrant reconsideration of the conclusions reached by previous investigators. In any future epidemic it would seem advisable that more attention be given to this possibility. The author realizes that this theory of transmission of infection has weaknesses. Until the reason for this seasonal occurrence has been discovered, any rational theory of transmission that has not been definitely disproved deserves consideration.

Surgery, Gynecology and Obstetrics, Chicago

70: 129-256 (Feb. 1) 1940

- Measurements of Uterine Contractions in Late Pregnancy: Study of Five Patients with Lörand Tocograph. D. P. Murphy, Philadelphia.—p. 129.
- Endometriosis of Sigmoid, Rectosigmoid and Rectum. C. W. Mayo and J. M. Miller, Rochester, Minn.—p. 136.
- *Ludwig's Angina. A. C. Williams, Boston.—p. 140.
- Formation of Ganglions and Cysts of Menisci of Knee: Observations on Golgi Apparatus. E. S. J. King, Melbourne, Australia.—p. 150.
- Irritation of Respiratory Tract and Its Reflex Effect on Heart. L. C. Reid and D. E. Brace, New York.—p. 157.
- *Malignant Disease of Face, Mouth, Pharynx and Larynx in First Three Decades of Life. G. B. New and C. S. Hertz, Rochester, Minn.—p. 163.
- Experimental Study of Uretero-Intestinal Implantation: III. Significance of Ureterodistal Reimplantation in Chicken. H. M. Weyrauch Jr. and F. Hinman, San Francisco.—p. 170.
- Ureteral and Renal Complications of Carcinoma of Cervix: Their Classification and Management. H. L. Jaffe, J. V. Meigs, R. C. Graves and C. J. E. Kickham, Boston.—p. 178.
- Malignant Tumors of Thyroid Gland: Report of 200 Consecutive Cases. U. V. Portmann, Cleveland.—p. 185.
- Plastic Restoration of Deformity Caused by Complete Exenteration of Orbit. A. Hagedoorn, Amsterdam, Netherlands.—p. 193.
- Intracranial Collections of Iodized Oil Following Lumbar Myelography. L. H. Garland and E. J. Morrissey, San Francisco.—p. 196.
- Anesthesia in Thyroidectomy for Thyrotoxicosis. W. H. Cole and R. Brunner, Chicago.—p. 211.
- Ovarian Autografting for Endometriosis. V. S. Counsellor and D. H. Wrook, Rochester, Minn.—p. 220.
- Sarcoma of Endometrial Stroma. J. R. McDonald, A. C. Broders and V. S. Counsellor, Rochester, Minn.—p. 223.
- Rhabdomyosarcoma of Corpus Uteri. R. E. L. Gunning and C. A. Ross, Galesburg, Ill.—p. 230.
- Phlegmonous Gastritis. E. C. Cutler and J. H. Harrison, Boston.—p. 234.
- *Observations on Acute Appendicitis: Series of 635 Cases. I. Busch and A. H. Spivack, New York.—p. 241.

Ludwig's Angina.—Williams points out that the mortality in thirty-one recent cases that he collected from five local hospitals was 54 per cent. Such a rate suggests that the disease does not receive proper recognition and treatment. In Ludwig's angina a massive swelling, often bilateral, always brawny and tender but rarely fluctuant, involves the suprahyoid region, being extreme in the submaxillary area. The overlying skin is conspicuously free of inflammation, showing only edema. The floor of the mouth is raised, edematous and brawny. The mucous membrane beneath the tongue is often ulcerated and dirty grayish white. The tongue is swollen and pushed upward, and it may become so crowded by sublingual edema that its tip protrudes between the teeth. Respiratory obstruction, due to blockage of the airways by an elevated or edematous tongue, is frequent. Emergency tracheotomy was performed on eight of thirty-one patients in this study. Four patients on whom tracheotomy was not done died of asphyxia. Bronchopneumonia complicated eight cases, seven of which terminated fatally. Extension of the infection took place in eight cases, seven of which were fatal. The

aims of treatment are to establish an airway, to relieve tension, to secure drainage and to combat the infection through supplementary measures. Tracheotomy is the most dependable means of securing an adequate airway. The tracheotomy incision should commence just below and slightly anterior to the angle of the jaw and run forward, parallel to and about 1 cm. below the body of the mandible, until it reaches the midline anteriorly. It should divide the deep cervical fascia, the mylohyoid diaphragm and the anterior belly of the digastric muscle penetrating upward so that the tongue and the mucous membrane of the floor of the mouth may be explored. Such an incision lessens tension and improves the airway. The choice of anesthesia warrants deliberation. At the Boston City Hospital pentothal was used in four and evipal in two cases of Ludwig's angina of the present series. Pentothal sodium is offered as a suggestion which future experience may or may not substantiate. Its use must be restricted to those familiar with the administration of pentothal. Sulfanilamide is of great value in cases showing positive *Streptococcus haemolyticus* cultures. Zinc peroxide is indicated when anaerobic organisms are present.

Malignant Disease of Face and Oral Cavity.—New and Hertz review the histories of the 233 patients up to 30 years of age who were treated for malignant disease of the face, mouth, pharynx or larynx. The number of cases of malignant disease increased with each succeeding decade. There were 100 cases of squamous cell epithelioma, and the five year survival figures were similar to those of other observers. In other words there is real prognostic value in grading such malignant growths, as one can offer the patients with grade 1 lesions a 90 per cent chance for recovery whereas the prognosis for those with grade 4 lesions is very poor (3.8 per cent). Malignant disease of the tongue, palate, tonsil, pharynx, upper jaw and antrum, lower jaw and larynx in young persons is thought to carry a poor prognosis. However, of the seventy-three patients who were traced, twenty-four (32.9 per cent) were living five years after treatment and of the thirty-six patients who were traced eleven (30.6 per cent) were living ten years after treatment. If cancer of the lip is included, of the 111 patients who were traced fifty-six (54.4 per cent) were living five years after treatment and of sixty-three traced for ten years thirty-two (50.7 per cent) were living.

Acute Appendicitis.—Busch and Spivack base their remarks on an analysis of 635 consecutive cases of acute appendicitis at the Beth Israel Hospital in which about seventy different surgeons, including twenty house surgeons, performed operations. The mortality was 2.2 per cent. The factors found to contribute to the mortality have been the duration of the disease and the use of cathartics. Diabetes was also found to be a serious complication. Cathartics definitely increase the severity of the disease. There should be no temporizing in cases suspected of being acute appendicitis when diabetes is a complicating factor because the pathologic process advances with great rapidity in such cases. Gangrenous appendicitis with perforation gave the highest mortality in the series. The general rule in this hospital is to operate immediately when the diagnosis of acute appendicitis has been established.

Texas State Journal of Medicine, Fort Worth

35: 595-662 (Jan.) 1940

- Surgical Evaluation of Pathologic Gallbladder. H. R. Owen, Philadelphia.—p. 600.
- Diagnosis and Treatment of Acute Intracranial Hematomas. S. R. Snodgrass, Galveston.—p. 605.
- Sterility in the Female: Its Study and Treatment. M. J. Meynier Jr., Houston.—p. 610.
- Oxygen Therapy and Oxygen Therapy Equipment, with Special Reference to Improved Oxygen Therapy Tent for Administration of High Concentrations of Oxygen. T. A. Taylor and Marian A. Baker, Lufkin.—p. 615.
- Clinical Observations on Pure Glucoside of Digitalis Lanata, Digoxin. E. H. Schwab, Galveston.—p. 619.
- Encephalomyelitis as Complication of Vaccinia: Report of Case. J. A. Nunn and P. Magrath, San Antonio.—p. 622.
- Use of Tellurite Mediums in Diphtheria Culture. J. T. Polcher, Corpus Christi.—p. 624.
- Clinical Management of Laryngeal Carcinoma. L. M. Sellers, Dallas.—p. 627.
- Leprosy as Public Health Problem. F. A. Johnson, Carroll, La.—p. 629.
- plea for Greater Unity Between the Medical and Public Health Professions. J. N. Baker, Montgomery, Ala.—p. 635.
- Intracapsular Cataract Surgery. W. S. Webb, Fort Worth.—p. 641.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

14: 279-358 (Dec.) 1939

- *Prognosis in Celiac Disease: Review of Seventy-Three Cases. C. Hardwick.—p. 279.
Use of Irradiated Evaporated Milk in Infant Feeding. R. W. B. Ellis.—p. 295.
*Cause of Reduction of Sugar Content of Cerebrospinal Fluid in Meningitis. Esther Hendry.—p. 307.
Iron-Resistant Anemia and Latent Rickets in School Children. Nuala Crowley and S. Taylor.—p. 317.
Pneumonia in the Newborn. Agnes R. Macgregor.—p. 323.

Prognosis in Celiac Disease.—Hardwick followed up seventy-three cases of celiac disease observed between 1923 and 1938. The diagnosis of celiac disease was made on the history of diarrhea, anorexia and loss of weight, accompanied by the classic clinical features and the finding of an excess of normally split fat in the stools on more than one occasion. Fifteen years has elapsed since the first patient was seen and the oldest living subject is now 16½ years old. Twenty-two of the patients died in the hospital, and all but ten (14 per cent) of the remainder have been traced. Four other patients died when the disease was not active. Those alive have been examined to determine if the disease was active, cured or quiescent, or if it had left any trace of its activity. Death was usually due to an exacerbation of the disease, the diarrhea increasing and dehydration and intoxication becoming marked. Only four children died from bronchopneumonia. Seventeen patients appeared to have recovered clinically and biochemically for more than three years; ten had been in a similar condition for less than three years. Together these form a group of 37 per cent of the whole. The disease of six patients is still in its first phase of activity. Four patients were thought to be well until stool analyses showed steatorrhea. These patients are in a quiescent phase of the disease, which, if in adult life it becomes reactivated, is usually diagnosed as idiopathic steatorrhea. To such the name latent celiac disease should be given. Patients who have had celiac disease tend to remain dwarfed, but their intellect is not affected.

Sugar Content of Cerebrospinal Fluid in Meningitis.

—Reduction in the dextrose content of the cerebrospinal fluid is a familiar observation in all forms of meningitis, but the cause of this has not yet been definitely determined. Hendry reviews the literature, from which it seems unlikely that lessened permeability of the choroid plexus to the passage of sugar into the cerebrospinal fluid is the cause for the reduction. The evidence points to the reduction being due to the action either of bacteria or of leukocytes. The author devised tests to determine if there is an alteration in the permeability of the blood brain barrier to dextrose, if the action of bacteria is the cause of the reduction or if the presence of leukocytes is responsible for the reduction. He observed that in the early stages of cerebrospinal fever a greatly increased cell count and a positive bacterial culture are almost invariably encountered. At this time the sugar content is extremely low. The patients were treated with sulfanilamide, and a sterile cerebrospinal fluid was found on the second or at the latest on the third occasion on which lumbar puncture was performed. As at this stage of the illness the cell count is still high and the sugar content, though rising, well below normal limits, these observations would suggest that meningococci are not responsible for the breakdown of dextrose. In cases of meningococcal meningitis the cell picture of the fluid changes from being almost entirely polymorphonuclear to one composed largely of lymphocytes. In the early stages there is great reduction in the cerebrospinal fluid sugar content, while in the later stages when the exudate is largely composed of lymphocytes the sugar content approaches the normal level. In conditions such as benign lymphocytic meningitis, in which there is a purely lymphocytic exudate, there is no sugar reduction in the spinal fluid. Two cases of meningitis due to *Bacillus coli* showed complete absence of cerebrospinal fluid sugar, an occurrence which might be expected as two factors are operative: a strongly glycolytic organism in addition to a large polymorphic cellular exudate. In tuberculous meningitis conclusions are not so easily drawn but it is suggested that, as the tubercle bacillus has practically no power to break down sugar and as it is present in the cerebrospinal fluid only in small numbers, the part that it

plays in reducing cerebrospinal fluid sugar need not be considered. In the early stages of the disease the cellular exudate in the spinal fluid is largely lymphocytic and at this time the sugar content of the fluid is not greatly below normal. As the disease progresses to its fatal issue there is an increase in the number of polymorphonuclear cells and a simultaneous decrease in the sugar content. It is concluded that polymorphonuclear leukocytes possess powers of glycolysis and their presence is the reason for reduced cerebrospinal fluid sugar in purulent meningitis and for the progressive decrease in its sugar content in tuberculous meningitis.

Australian J. Exper. Biol. and M. Science, Adelaide

17: 333-464 (Dec.) 1939. Partial Index

- *Anatomic Distribution and Character of Lesions of Poliomyelitis, with Special Reference to Type of Cell Affected and to Port of Entry of Virus. C. Swan.—p. 345.
Poliomyelitis: III. Use of *Macacus Cynomolgus* as Experimental Animal. F. M. Burnet, A. V. Jackson and E. G. Robertson.—p. 375.
Spreading Power of Some Bacteria Associated with Corynebacterium Diphtheriae in Faucial Diphtheria. H. Wilson.—p. 393.
Studies in Respiration: I. Simple Method for Investigation of Fractional Samples of Expired Air. F. S. Cotton.—p. 425.
Id.: II. Occurrence of Apparently Paradoxical Rise in Oxygen Percentage of Increasingly Deeper Samples of Alveolar Air. F. S. Cotton.—p. 433.
Vitamin A and Vitamin D Content of Some Australian Fish Liver Oils. M. M. Cunningham and E. C. Slater.—p. 457.

Distribution and Character of Lesions of Poliomyelitis.

—From a microscopic examination of the central nervous system in eight cases of poliomyelitis Swan makes the following remarks: The distribution of the meningeal infiltration is modified by the flow of the cerebrospinal fluid. Necrosis of nerve cells in the cerebral cortex is confined to the area gigantopyramidalis, and almost entirely to the Betz cells of that area. The rhinencephalon (including the olfactory bulbs) was surprisingly but slightly involved. Lesions were found only in the anterior perforated substance and in one instance in the cornu ammonis. Evidence for the process of neuronophagocytosis was seen in the pigmented cells of the locus caeruleus. Selective affinity of the virus for cells of the motor type is not absolute except perhaps in the cerebral cortex and the cerebellum. However, motor cells are more often and more severely involved than sensory cells. The medial longitudinal bundle seems an important path for the spread of the pathologic process. Infection by the virus of poliomyelitis by the olfactory route is either less common than was formerly thought or is not commonly fatal; i. e., the virus is localized in the olfactory bulbs and immunization takes place. Cases with initial bulbar palsy probably result from infection by the tonsillopharyngeal route. There is no fully conclusive evidence for infection by the gastrointestinal route in man.

British Journal of Dermatology and Syphilis, London

51: 501-574 (Dec.) 1939

- Pathogenesis of Rosacea: Review, with Special Reference to Emotional Factors. R. Klaber and E. Wittkower.—p. 501.

British Journal of Experimental Pathology, London

20: 439-518 (Dec.) 1939

- New Method of Culturing Sputum on Solid Mediums Using Carbon Dioxide for Isolation of Pneumococci. W. J. Auger.—p. 439.
Factors Influencing Infectivity of Fowl Tumors. F. R. Selbie and J. McIntosh.—p. 443.
Tissue Changes in Ascorbic Acid Deficient Guinea Pigs. D. L. MacLean, Margaret Sheppard and E. W. McHenry.—p. 451.
Neutralizing and Complement Fixing Properties of Antiserums Produced by Fractionated Extracts of Nonfilterable Dibenzanthracene Fowl Sarcoma. L. Foulds and L. Dmochowski.—p. 458.
Complement Fixing Antigen Common to Filterable and Nonfilterable Tumors of Fowls. L. Dmochowski and R. Knox.—p. 466.
Observations on Reaction Between Lethal Toxin of *Clostridium Welchii* (Type A) and Human Serum. F. P. O. Nagler.—p. 473.
Physical and Chemical Examination of Vaccinia Virus. A. S. McFarlane, M. G. Macfarlane, C. R. Amies and G. H. Eagles.—p. 485.
Alum Precipitated Diphtheria Toxoid. F. V. Linggood.—p. 502.
Further Studies on Absorption, Mobilization and Excretion of Lead. S. L. Tompsett.—p. 512.

British Medical Journal, London

2: 1261-1302 (Dec. 30) 1939

- The Painful Shoulder. P. D. Wilson.—p. 1261.
Treatment of Hemorrhoids. W. B. Gabriel.—p. 1266.
Electrically Induced Convulsions in Treatment of Mental Disorders. W. H. Shepley and J. S. McGregor.—p. 1269.
Treatment of Otorrhea by Argyrol Displacement. W. O. Reid.—p. 1271.
Acute Torsion of Gallbladder. A. H. Barber.—p. 1272.

Journal of Mental Science, London

SG: 1-194 (Jan.) 1940

- Review of Gestalt Psychology. J. M. Blackburn.—p. 1.
Clinical Study of Mescaline Psychosis, with Special Reference to Mechanism of Genesis of Schizophrenic and Other Psychotic States. G. T. Stockings.—p. 29.
Comparison Between Some Effects of Isomyn (Benzedrine) and of Methylisomyn. F. L. Golla, J. M. Blackburn and S. Graham.—p. 48.
Rehabilitation and Resocialization Scheme for Psychopathic Patients. L. H. Wootton and L. Minski.—p. 60.
Meinické Clarification Reaction: Factors Influencing Nonspecific Zone Phenomena. W. M. F. Robertson and D. B. Colquhoun.—p. 66.
Lesions of Spinal Column Resulting from Convulsion Therapy. G. Kraus, and H. J. Viersma.—p. 76.
Observations on Symptoms of Hyperinsulinism in Relation to Blood Sugar and Ketone Bodies of Blood. R. Freudenberg and J. Fine.—p. 84.
Psychology of Convulsion Therapy. D. W. Abse.—p. 95.
Some Clinical Examples of "Dys-Symbole": Its Relation to Shock Therapy. J. S. Thomas.—p. 100.
Some Further Observations on Vitamin C Estimations in Psychotic and Psychopathic Patients. L. Minski and N. D. Constantine.—p. 109.
"Stationary" General Paralysis of Insane: Report on Case of Thirty-One Years' Duration. A. J. Galbraith.—p. 112.

Lancet, London

2: 1353-1394 (Dec. 30) 1939

- *Electric Convulsion Therapy of Schizophrenia. G. W. T. H. Fleming, F. L. Golla and W. G. Walter.—p. 1353.
*Dark Adaptation Test: Its Reliability as Test for Vitamin A Deficiency. L. J. Harris and M. A. Abbasy.—p. 1355.
Pernicious Anemia in Egypt. S. A. Pasha and A. F. Zanaty.—p. 1359.
*Clinical Use of Triphenylchloroethylene. A. I. S. Macpherson and E. M. Robertson.—p. 1362.
Agranulocytosis Complicating Treatment of Acute Pemphigus with Sulfapyridine. D. Erskine and J. E. Roysds.—p. 1366.
Pemphigus Neonatorum Treated with Sulfapyridine. A. G. Troup and R. M. White.—p. 1367.
Otosclerosis Treated with Sex Hormones. J. Bernstein and L. Gillis.—p. 1368.
Redistribution of Abnormal Foot Pressure. M. S. Holman.—p. 1369.

Electric Convulsion Therapy in Schizophrenia.

Fleming and his associates point out that Cerletti and Bini reported in 1938 that the passage of a strong alternating current through the head usually resulted in immediate unconsciousness followed by a prolonged fit. They worked out a technic whereby this phenomenon could be used to replace the injection of convulsant drugs in the treatment of schizophrenia and administered shocks to several hundred patients. Fleming and his associates tested this method of electrical convulsion therapy on five schizophrenic patients. They administered seventy-five shocks, as a result of which there have been fifty major convulsions and twenty-five minor seizures. The major convulsions are similar to spontaneous ones and are followed by complete amnesia for the shock. No untoward results have been observed. The claims of Cerletti and Bini are confirmed; the method is technically effective, simple and safe and arouses no fear or hostility in the patients. No attempt is made to assess the therapeutic value of the method, which Cerletti and Bini state is the same as that of metrazol.

Dark Adaptation as Test of Vitamin A Deficiency.

Harris and Abbasy discuss experiments carried out to reinvestigate the reliability of dark adaptation tests for detecting deficiency of vitamin A. The Birch-Hirschfeld photometer was used, with several improvements in technic: a large screen was used for the "bleaching," and during the test the subject's attention was kept directed to the position of the quincunx. Two precautions were taken: 1. Each subject was reexamined repeatedly and the initial value not accepted until it had been found to remain relatively constant on successive occasions. 2. To check the specificity of the result, subjects found to be subnormal were divided into two groups, half being treated with the vitamin and the other half kept as controls. The criterion accepted for subnormal dark adaptation was a diaphragm reading of 6 or over (with wedge set at 5) after ten minutes in the dark; the reading immediately after the "bleaching" was considered of less value, mainly because of its rapid rate of change. Control tests indicate that, under the ordinary working conditions, previous exposure to light had no important influence on the results. Among middle-class adults cases of lowered dark adaptation seemed relatively rare and readings were not improved beyond the usual normal by treatment with vitamin A. The following evidence is offered that the method of the dark adaptation test is sound in principle: 1. Children found subnormal returned slowly to normal after treatment with large

amounts of vitamin A, whereas an equal number of controls left untreated remained subnormal. 2. Scrutiny of earlier results on children attending elementary schools revealed a heretofore unsuspected correlation with their individual dietary histories—among children having two thirds of a pint of milk at school 67 per cent were normal on test, whereas of those having one half pint or less only 37 per cent were normal. 3. The incidence of lowered dark adaptation among the various social classes examined has borne a relation to their dietary intake. 4. Attention is drawn to the work of other investigators proving a correlation between deficient intake of vitamin A and lowered dark adaptation. It is concluded that the theoretical basis of the test is reliable, although the apparatus and technic can be further improved. The dark adaptation test is capable only of detecting deficiency and not of assessing different levels of normality. Since the test is relatively intricate it is not suitable for rapid routine use by school medical officers. It can have its application in surveys on small selected samples of the population to confirm the supposition of deficient dietary intakes or for diagnosis in the clinic. Deficiency seems less common among adults than in children.

Clinical Use of Triphenylchloroethylene.—Macpherson and Robertson used triphenylchloroethylene in this investigation because its action is greater and more prolonged than that of triphenylethylene. The forty-one cases treated included amenorrhea, menopausal symptoms, atrophic vulvitis or some similar condition, atrophic rhinitis and cases in which it was desirable to inhibit lactation. Triphenylchloroethylene was prepared for oral use in tablet form, each tablet containing 200 mg.; in ampules containing 250 mg. dissolved in 5 cc. of sesame oil, suitable for injection, and in cocoa butter made up in the form of vaginal suppositories, each containing 100 mg. Tablets are given after meals, and as many as nine a day may be given without any fear of producing toxic effects. Two injections are given a week apart to begin with, followed by a third injection three weeks after the second. Subsequent injections may be given at intervals of three or four weeks according to the response produced. Vaginal suppositories are used nightly for the first fourteen days of treatment and then on alternate nights or every third night, as determined by the progress made. In each of the four cases of amenorrhea treated there have been periods of withdrawal bleeding between the courses of treatment. The total dosage that has produced this result has been from 12,000 to 16,000 mg. Of the patients with vulvitis and vaginitis, seven had atrophic rather than primarily infective vulvitis and vaginitis. The eighth patient in this group complained of intense itching of the vulva. The drug was given orally in four cases and by injection in four. The amounts used in each course of treatment were not constant throughout this group, but the variations were not wide. The result of the treatment in almost every case was complete relief from symptoms and in seven of eight cases the local condition was obviously improved. The patients with menopausal symptoms all received the drug in tablet form, from 200 to 1,800 mg. (from one to nine tablets) being taken daily for, in some cases, several successive courses of from four to five weeks. The effect of the drug was noticed within two days of the start of treatment, and after the average course, which lasted from three to four weeks, the action of the drug was maintained for another two weeks before any recurrence of symptoms was noticed. Triphenylchloroethylene was given to twelve patients to inhibit or stop milk secretion, six by mouth and six by injection. In those treated by mouth the total dosage has been about 4,000 mg. given over a period of five or six days. Where treatment was begun shortly after delivery, the breasts remained soft and painless in four of six cases. Of the other two patients, one experienced discomfort on the third day and the other secreted a considerable quantity of colostrum for three days but no milk. Of two patients, treated by injection on the first day of the puerperium, the breasts showed no engorgement and remained painless. Where lactation was already established, treatment by tablets or by injection of from 250 to 300 mg. led to cessation of milk secretion after from three to five days, and in no case was there any recurrence. Trichlorethylene has no definite toxic effects and can be administered in large doses or over a long period. The duration of action by mouth closely approximates that of stilbestrol. By injection, however, the duration is singularly prolonged; after

500 mg., by the technic described, effective action persists for from six to nine weeks. By this method, therefore, a very small dosage is sufficient to maintain a continuous high level of estrogen activity.

New Zealand Medical Journal, Wellington

38: 375-436 (Dec.) 1939

- Classification and Treatment of Nephritis. R. Chisholm.—p. 385.
Parathyroid Adenoma: Report of Case. D. Whyte.—p. 394.
*Congenital Neurosyphilis: Report of Two Cases in One Family. J. Borrie and M. McGeorge.—p. 398.
Intussusception Following Partial Gastrectomy: Report of Case. C. P. Powles.—p. 401.
The Medical Profession and the Social Security Act. J. P. S. Jamieson.—p. 403.

Congenital Neurosyphilis.—Borrie and McGeorge recently encountered two juvenile cases of congenital syphilis of the nervous system, one of the parenchymatous and the other of the interstitial type. The boy, aged 15 years, presented a typical instance of dementia paralytica, while his half-sister, 4 years, died from meningovascular syphilis. These children were the offspring of the same mother. There were no other children in the family.

South African Medical Journal, Cape Town

13: 775-794 (Dec. 9) 1939

- Modern Views on Diabetes Mellitus. I. Sacks.—p. 777.
Pneumonia in Children Treated with Sulfapyridine. W. Girdwood.—p. 781.
*Manzullo Immediate Tellurite Test in Diphtheria. J. F. Murray.—p. 787.

Tellurite Test for Diphtheria.—Murray compared the results of the tellurite test for diphtheria with the bacteriologic results of an unselected consecutive series of pharyngeal exudates. Owing to the long distances separating many practitioners from laboratories in South Africa and the consequent delay in receiving laboratory confirmation of a diagnosis of diphtheria, the author felt that the test if its reliability was confirmed would be especially valuable under the conditions existing in South Africa. The results of the test in a series of sixty-two cases show thirty-eight positive direct tellurite tests, but eleven (28.9 per cent) of these were neither bacteriologically nor clinically acceptable as cases of diphtheria. In twenty-four cases giving a negative tellurite test, five (20.8 per cent) were definite cases of diphtheria. Putting the results in another way, 84.3 per cent of the diphtheria cases gave positive results, but on the other hand 36.6 per cent of nondiphtheritic cases also gave positive results. These results correspond closely to those obtained by Tombleson and Campbell, by Cooper and his associates and by Tynan (1939). With such a high percentage of error in each direction it seems unlikely that the test is of any practical value. Reliance for the diagnosis of diphtheria in this area at least must continue to be placed on the clinical and bacteriologic observations. The varying reports made on results of the test in different series since Manzullo's publication would appear to bear out the percentage error. In Johannesburg at least it has failed to provide any reliable assistance in the more speedy diagnosis of diphtheria.

Tohoku Journal of Experimental Medicine, Sendai

37: 189-372 (Dec.) 1939. Partial Index

- Influence of Short Wave Irradiation on Glomerular Filtration and Tubular Retroresorption in Normal and Enervated Kidney. M. Koiba.—p. 202.
Arakawa's Reaction and Vitamin C Content of Human Milk: Part V. Difference Between Arakawa-Negative Human Milk and Human Milk Made Arakawa Negative by Ascorbic Acid Added. S. Isono.—p. 216.
*Behavior of Basophil Erythrocytes in Some Surgical Diseases, with Especial Consideration of Renal Tuberculosis. H. Kamioka.—p. 263.
Action of Bile on Intestinal Tonus and Peristalsis. S. Kawada.—p. 317.
Does Exclusion of the Carotid Sinus Augment Epinephrine Secretion from Suprarenal Gland in Nonanesthetized Dog? M. Wada, T. Hirano and Y. Tanetti.—p. 335.
Elimination of Hippuric Acid in Urine Following Benzoic Acid Tolerance Test in Surgical Renal Diseases. I. Suzuki.—p. 346.
Behavior of Dry Substance, Ash and Total Nitrogen in Impairment of Liver. Tsi-Tsao Chen.—p. 360.
Distribution of Nitrogen in Liver Following Poisoning with Phosphorus. Tsi-Tsao Chen.—p. 367.

Behavior of Basophilic Erythrocytes in Surgical Diseases.—According to Kamioka the basophilic erythrocytes, that is, polychromatophilia and basophilic stippling, have been regarded by some as a degenerative process of the erythrocytes, by others as a sign of regeneration. Basophilic stippling was observed first chiefly during lead poisoning but later also

in anemias and in various renal disorders. The author decided to investigate their occurrence during surgical disorders, particularly those of the kidney. He made investigations on forty healthy persons and on 204 surgical patients. Among the latter group there were thirty with acute pyogenic infection, fifty with tumors, mostly cancers, twenty-one with extrarenal surgical tuberculosis, sixty-seven with renal tuberculosis and twelve with other surgical diseases of the kidneys. In the healthy persons the average number of basophilic erythrocytes was 159. In the acute pyogenic infections the basophilic erythrocytes were considerably increased, the average number being 432. In the mild and localized pyogenic infections the increase was mild, but in the cases of sepsis, particularly those in which the erythrocyte count and the hemoglobin value were reduced, the increase in basophilic erythrocytes was great. The increase was especially noticeable after surgical removal of the focus and evacuation of the pus. In sepsis which had a lethal outcome there was no increase in the basophilic erythrocytes. In the patients with cancer the basophilic erythrocytes were slightly increased, but the increase became greater following the radical removal of the cancer. In extrarenal surgical tuberculosis (chiefly tuberculosis of the lymph nodes, bones and joints) the increase in basophilic erythrocytes was moderate. In the patients who had undergone nephrectomy for renal tuberculosis the author observed that the increase in basophilic erythrocytes was the more noticeable the less advanced was the destruction of the renal parenchyma. In the nontuberculous surgical diseases of the kidney the basophilic erythrocytes showed a more or less pronounced increase even in the absence of anemia and renal insufficiency. The author reaches the conclusion that the increase in the basophilic erythrocytes must be regarded as a regenerative process of the erythrocytes.

Archives des Maladies de l'Appareil Digestif, Paris

29: 817-936 (No. 8) 1939

- Endoscopic Studies of Operations on Stomach. F. Moutier and B. Ghelwe.—p. 817.
Diffused Epitheliomatous Lymphangitis of Stomach. A. Cain and R. Claisse.—p. 834.
*Ulcers of Second Portion of Duodenum: Case. M. Brulé, P. Hillemand, E. Gilbrin and L. Callandry.—p. 846.
*Ulcers of Second Portion of Duodenum. J. Demirleau.—p. 856.

Ulcers of Second Portion of Duodenum.—Brulé and his associates report a case of ulcer of the second portion of the duodenum in which gastro-enterostomy was successfully performed. A man aged 29 had severe attacks of pain for five years that appeared but once each year, lasted about twenty days and were eased by vomiting. The last onset was attended by hematemesis that made blood transfusion necessary. Roentgenograms revealed a deep cavity at the interior edge of the upper part of the second portion of the duodenum. Two thirds of the way above this cavity the second portion was found narrowed with an irregular marginal configuration, contrasting with the dilatation noticeable in the lower part of the second and in the third portion. Duodenal ulcers of the second portion are usually found between the upper bend and the ampulla of Vater. They are terebrant, affect the pancreas and are accompanied with serious manifestations of periduodenitis and pancreatitis. They often appear as huge tumoral masses with hyperemia of tissues and pronounced vascularization. The authors stress the importance of a differential x-ray diagnosis directed to duodenal diverticula, to the dilatation of the ampulla of Vater, especially when it attains significant dimensions, and to certain bulbar ulcers, since in consequence of inflammatory reactions or adhesions the shape and contour of the bulb may be completely modified. Complications in duodenal ulcers of the second portion may be due to stenosis of the bile duct and duodenum, to pancreatitis and to perforation. Hemorrhages are frequent. The choice between medication and surgical intervention is determined by the consideration of the frequency of hemorrhages and the presence of a considerable inflammation in the area about the ulcer. The surgical operation of choice depends on the presence or absence of the tumoral mass, its site, its size and the extent of vascularization. In the present case the presence of a crater across the anterior wall large enough to allow a finger to pass through and the considerable degree of vascularization rendered exeresis impossible and made gastro-enterostomy the surgical method of choice.

Ulcers of Second Portion of Duodenum.—Demirleau reports four cases of duodenal ulcers in which, on clinical and radioscopic examinations, gastrectomy with exclusion was performed. The age of the patients ranged between 28 and 56 years. In all patients gastric or epigastric pains had made their first appearance in early infancy (second or third year). In all four cases large ulcers were discovered in the second portion of the duodenum, three times with implications of pancreatitis. In one case a stenosis was found below the upper bend, large enough to prevent passage of a finger. In another case the base of the ulcer was situated 2 cm. above the ampulla of Vater and the ulcer had eaten its way into the bile duct causing an opening of more than 1 cm. All cases had fatal endings, three from complications (pneumonia, peritonitis, pleurisy), the fourth from an involvement of surgical complications. Four necroscopic views with reduced replicas are shown.

Journal de Chirurgie, Paris

55:1-96 (Jan.) 1940

Radical Treatment of Large Genital Prolapse: Total or Subtotal Colpectomy with Vaginal Hysterectomy and Perineovulvar Plastic Operation. G. Rouhier.—p. 1.

Occlusive Treatment of Fractures of War. J. Soulié and C. Linares.—p. 22.

Two Attempts at Cortico-Adrenal Reactivation by Enervation of Sinus Caroticus. L. Léger.—p. 38.

Adrenal Reactivation by Enervation of Sinus Caroticus.—Léger reports two cases of adrenal insufficiency. A woman aged 52, who had attacks of feebleness and the pigmentation characteristic for adrenal insufficiency, did not show noticeable improvement from treatment with adrenal cortex extract. Enervation of the sinus caroticus was made on the right side. The emaciated patient tolerated the operation well. Four months later the facial pigmentation had greatly diminished but in other parts of the body the pigmentation was still largely unchanged. The patient had gained 15 Kg., the arterial tension had increased and the asthenia had completely disappeared. A man aged 40, who had pulmonary tuberculosis and later developed the symptoms of Addison's disease, namely pigmentation, asthenia, digestive disturbances and low arterial tension, experienced only a slight amelioration of short duration from adrenal cortex extract, so enervation of the sinus caroticus was performed on the right side. The patient's appetite increased, and vomiting and constipation subsided. The arterial tension did not change much and the pigmentation persisted, although the patient declared that it showed a tendency to diminish. The author reviews the literature on the enervation of the sinus caroticus in Addison's disease. He concludes that the results justify further trials of this method.

Presse Médicale, Paris

47:1625-1648 (Dec. 19) 1939. Partial Index

Gangrene in Obliterated Aneurysms of Members: Nature of Humid Gangrene. R. Leriche and F. Froehlich.—p. 1625.

Iron in Therapeutic Hydrology. M. Pieri and J. Enselme.—p. 1628.

Cushing's Syndrome. D. Furtado and X. Morato.—p. 1632.

Section of Preaortic Plexus: Justification and Technic. G. Arnulf.—p. 1635.

Primary Anthrax of Pharynx. R. F. Vaccarezza.—p. 1642.

Late Accidents After Use of Oil Suspensions of Gold Salts. G. Rossel.—p. 1644.

Case of Infantile Pulmonary Tuberculosis with Elimination of Pneumoliths. L. de Castro Freire and A. Saldanha.—p. 1647.

Late Accidents After Use of Oil Suspensions of Gold Salts.—Rossel reproduces a roentgenogram which shows small, well circumscribed spots of great density on both sides of the pelvis, at the level of the iliac crest. These spots were explained when the patient recalled that two years before she had received intramuscular injections of an oil suspension of calcium aurothioglycolate. The injections had been made into the gluteal region and the patient had received no other injections into this region; it cannot be doubted that the small spots correspond to the oil droplets of gold salts. What makes the case especially noteworthy is the long persistence of the oil depots—two years—and the local tolerance. The oil suspension of calcium aurothioglycolate seemed to be encysted like grains of granulated metal. The author thinks that this case is probably far from being unique and that it might explain why complications seem much less frequent with oil suspensions than with aqueous solutions of gold salts. In numerous cases this is probably due to the total or almost total absence of absorption in the case of the

oil suspensions. This in turn raises the question of the therapeutic efficacy. The author concludes that the problematic advantages of the oil suspensions of gold salts do not counterbalance the grave dangers which may appear even long after the treatment.

47:1649-1672 (Dec. 20-23) 1939

Endogenic Origin of Carbon Monoxide in Blood. M. Loeper and E. Gilbrin.—p. 1649.

New Chapter on Hygiene of Habitation or Living Conditions in the Shelters. Cot and Genaud.—p. 1650.

Antityphoid Vaccination by Typhoid-Endo-Anatoxin: Application and Results (1923 to 1938). E. Grasset.—p. 1653.

Disturbances of Transit of Secretions in Principal Biliopancreatic Passage: Cholecystostomy as Diagnostic Aid. De Haven, Godart and Helman.—p. 1656.

Rarity of Neurosyphilis in Prostitutes. Boisseau, Spinetta, Druelle and Durandy.—p. 1658.

Clinical Utilization and Therapeutic Results of Gonadotropic Substance. R. Contamin and F. Lerailliez.—p. 1660.

Endogenic Origin of Carbon Monoxide in Blood.—Loeper and Gilbrin investigated the carbon monoxide content in various types of anemia. In a case of hemogenic anemia and in four cases of cancerous anemia the value was increased. It was increased also in several cases of polyglobulism in respiratory disturbances, in alcoholic cirrhoses, in a case of acute polyarthritis, in cases of epilepsy, in a case in which suicide had been attempted by means of barbitol, and in cases of diabetes and oxalemia. However, the authors emphasize that the carbon monoxide content of the blood is increased in only some of the cases. Because of the absence of exogenic causes, the authors believe that the increased carbon monoxide content results from disturbances in the tissue metabolism. Carbon monoxide is a product of the incomplete combustion of substances rich in carbon. The fact that an increased carbon monoxide content of the blood is encountered in subjects with pulmonary or circulatory disorders confirms this hypothesis. The substances which more than others can give rise to carbon monoxide are the glucides. After reviewing experimental studies on this problem, the authors say that they are in accord with the theory which ascribes the excess of carbon monoxide to a disturbance in the metabolism of the glucides. The frequency of an excessive carbon monoxide content in the blood of patients with diabetes supports this hypothesis.

Schweizerische medizinische Wochenschrift, Basel

69:1321-1344 (Dec. 30) 1939. Partial Index

Mineral Metabolism and Mercury Diuresis. G. Schönholzer.—p. 1321.

Treatment of Gout. T. Schaeppi.—p. 1326.

Casusistic Contribution to Treatment of Tabetic Crises: Insulin in Control of Lancing Pains. H. Binswanger.—p. 1327.

Can Otosclerosis be Influenced by Vitamins? M. Baer.—p. 1328.

Improved Resorption of Vitamin A. H. Minibek.—p. 1332.

Beta-Phenyl Alkylamine in Treatment of Nocturnal Enuresis. S. Muntner.—p. 1333.

Insulin in Tabetic Crises.—Binswanger reports observations on a patient with severe tabetic crises, in whom only fever therapy was effective. However, the effects of the fever therapy were of short duration. Insulin shock therapy was resorted to and following this the tabetic crises subsided for a time. When the pains recurred it was decided to try to counteract the crises by a "weakened" administration of insulin. It was found to be sufficient for the hypoglycemia to produce a slight somnolence and profuse sweating. The insulin should be extended over a period of from two to three weeks and should be begun when the tabetic pains have been absent for several days, for attacks of lancinating pains, persisting for several days, apparently cannot be broken off by insulin therapy. The insulin treatment improves the general condition and puts the patient into a euphoric mood. If insulin should prove effective in other cases of tabes with lancinating pains, it would be a distinct advancement in the treatment of painful tabetic crises.

Settimana Medica, Palermo

27:1353-1378 (Nov. 23) 1939. Partial Index

Staphylococic Toxoid in Treatment of Staphylococic Infections. P. Ritossa and G. Polistina.—p. 1362.

Toxoid in Staphylococic Infection.—Ritossa and Polistina resorted to staphylococic toxoid in seventy-six cases of cutaneous and surgical staphylococic infections (furuncles, abscesses, infected sores, infected wounds and osteomyelitis) or staphylococic septicemia. The authors used toxoid with an antigenic value which corresponded to 16 staphylococic units.

for each cubic centimeter of the preparation. The presence or absence of allergy was ascertained by subcutaneous injection of 0.1 cc. of staphylococcic toxoid. In the absence of allergy the treatment consisted of five subcutaneous injections at intervals of five days in increasing doses of 0.5, 1, 1.5 and 2 cc. of toxoid up to a total dose of 5 cc. for the entire treatment. In rare cases the treatment was repeated. It was administered alone or in association with surgical operation, according to indications. The treatment was well tolerated. It rapidly controls local and general staphylococcic infections. In surgical infections it rapidly accelerates the processes of suppuration, detersion and healing of infected tissues or bone, after the operation. Septicemia is rapidly controlled. The author advises the treatment in the various forms of cutaneous and surgical staphylococcic infections and in general staphylococcic septicemia.

Boletin de la Asociacion Médica de Puerto Rico

32: 1-34 (Jan.) 1940. Partial Index

Inversion of Uterus Post Partum. L. A. Balasquide and W. R. Gelpi.—p. 3.

*Acute Mesenteric Lymphadenitis. J. Noya Benitez.—p. 8.

Acute Mesenteric Lymphadenitis.—Noya Benitez observed nine children ranging in age from 5 to 12 years who were suffering from acute mesenteric lymphadenitis. The patients reported an attack of cold and cough for a few days preceding the onset of acute abdominal pain which developed in association with nausea, vomiting, fever and tenderness and muscular resistance at the right lower quadrant. They had a history of similar recurrent and subacute attacks in the past. Leukocytosis existed in all cases. Appendectomy was performed during the first twelve hours after the patients entered the hospital. Acute appendicitis coexisted with acute mesenteric lymphadenitis in three of the cases. In all cases appendectomy caused the symptoms of acute mesenteric lymphadenitis to subside and controlled the attacks, and the results appear to be permanent. The author found it difficult to differentiate between acute appendicitis and acute mesenteric lymphadenitis. The two conditions frequently coexist. The attacks of acute mesenteric lymphadenitis are controlled by appendectomy. He concludes that immediate appendectomy is the proper treatment of acute mesenteric lymphadenitis, whether or not the disease coexists with acute appendicitis.

Archiv für Kinderheilkunde, Stuttgart

118: 113-208 (Dec. 19) 1939. Partial Index

Monocytic and Myeloid Leukemic Reaction in Severe Fibrinonecrotizing Stomatitis in Children. E. Krüger.—p. 113.

Estimation of Circulation in Young Persons. H. Rieger.—p. 123.

Old and New Methods of Treatment in Gonorrheal Vulvovaginitis in Children. H. Nagel.—p. 133.

Results of High Altitude Flight in Children with Whooping Cough. Brigitte Kujath.—p. 140.

*Disturbances in Growth of Bones Following Chronic Renal Changes. S. Werner.—p. 145.

Experimental Investigations in So-Called Renal Diabetes. R. Kortum.—p. 162.

Vitamin B₁ Content of Urine in Postdiphtheric Paralysis. H. Reinhard and K. Schwartz.—p. 192.

Disturbances in Bone Growth Following Renal Changes.—Werner describes observations on a child, aged 1 year, who had a severe renal disorder presenting the aspects of chronic pyuria. The child was under observation for about a year, during which time disturbances in growth and osseous changes developed. The clinical aspects seemed to place the disorder in the group of renal rickets (Parsons' type III). Necropsy revealed a severe chronic nephritis, hyperplasia of the parathyroids and, in the bones, osteitis fibrosa generalisata (Recklinghausen). The author raises the question whether some cases of renal rickets actually are true rickets or whether a disease entity exists that develops from the metabolic disturbance, which in turn is caused by the impaired renal function and by way of the hyperplasia of the parathyroids and which becomes manifest either in the form of rachitis-like growth disturbances in the bones or in the form of osteitis fibrosa generalisata. He suggests that cases of rickets which prove resistant to vitamins might perhaps find their explanation in this manner. The metabolic disorder or the parathyroid hyperplasia would not necessarily have to be of nephrogenic origin.

Fortschritte a. d. Gebiete der Röntgenstrahlen, Leipzig

60: 391-472 (Dec.) 1939. Partial Index

Accuracy of Roentgenologic Diagnosis in Diseases of Stomach and Duodenum. H. Keutner.—p. 421.

*Localization of Foreign Bodies in Human Organism by Means of Simultaneous Double X-Ray Exposure. T. Shiga.—p. 442.

*Vertebral Column and Eunuchoidism. A. G. H. Lindgren.—p. 448.

New Picture Field Diaphragm. K. Gund.—p. 457

Localization of Foreign Bodies by Double X-Ray Exposure.—Shiga says that foreign bodies of hard substances deep within the body can be localized exactly by his method of simultaneous double x-ray exposure. The theoretical foundation of this method is almost like that of the shifting methods of exposure devised by other investigators; however, the author adds a further theoretical development and geometrical explanations. The error of experimental observation totals 0.95 per cent and amounts to only 1 or 2 mm. of the true length of the object. This method of double exposure by means of parallel x-ray tubes can be used not only for the localization of foreign bodies but also in the diagnosis of digestive, urogenital and orthopedic disorders. Furthermore, it can be used for industrial purposes, such as for the inspection of cast-metal work.

Vertebral Column and Eunuchoidism.—Lindgren reviews two cases of eunuchoidism, one concerning a woman, the other one a man. In the woman a roentgenogram of the tubular bones made at the age of 32 had revealed several open epiphyses, but at the necropsy ten years later they were found closed. In the male patient earlier roentgenograms were not available. In the woman the author gave his attention chiefly to the vertebral column. He observed among other changes irregular ossification of the epiphysal plates; that is, conditions indicative of inhibited development of the vertebral bodies. He thinks that this inhibition is probably the result of gonadal hypofunction. However, he does not think that the inhibited ossification produced a noticeable increase in the size of the vertebrae. In eunuchoidism the extended growth of the long tubular bones, as the result of the persistence of the epiphyses, contrasts with that of the vertebral column and this explains the typical eunuchoid proportions of the body. This accords with Schmorl's opinion, according to which the epiphysal plates of the vertebrae cannot be compared with the epiphyses in the long bones and do not play a part in the longitudinal growth of the vertebral bodies. In the reported case it is noteworthy that the vertebral column still exhibited signs of continuous growth at a time at which growth in the long bones was already completed. The author concludes that in eunuchoidism, probably as a result of gonadal insufficiency, the growth of the long tubular bones progresses unchecked. The epiphysal plates of the vertebrae, although they do not have the same functional significance as have the epiphyses of the long bones, apparently are likewise subject to incretory regulation, for in the reported case the gonadal hypofunction resulted in an inhibition of their ossification. The author recommends studies on the epiphysal plates of the vertebrae in other endocrine disorders.

Geburtshilfe und Frauenheilkunde, Leipzig

1: 727-784 (Dec.) 1939

Functional Disturbances of Ovarial Follicle Formation, Especially "Follicle Persistence." R. Schröder.—p. 727.

Disorders of Gallbladder in Pregnancy. H. Vignes.—p. 743.

X-Ray Diagnosis of Early Pregnancy. M. Kneer.—p. 748.

*Difficulties of Clinical Diagnosis in Advanced and Full Term Extra-Uterine Pregnancies. T. Pütz.—p. 755.

Effect of Diethylstilbesterol on Women. H. Rauscher.—p. 764.

Advanced and Full Term Extra-Uterine Pregnancies.—Pütz reports three cases of extra-uterine pregnancy that exemplify the diagnostic difficulties encountered in ectopic gestation. He stresses the need of observing features suggestive of extra-uterine pregnancy. Among these are poor physical condition, an intact portio at the end of pregnancy, exceptionally vigorous fetal movements that cause no pain, pain during the second half of pregnancy (not always present), Cullen's sign, and the distinct palpability of fetal parts under the abdominal wall. He thinks that extra-uterine pregnancies are due for the most part to inflammatory conditions in the oviducts or pelvic organs of maturer women who either have borne no children or have undergone periods of sterility after previous parity.

Klinische Monatsbl. f. Augenheilkunde, Stuttgart

103: 561-685 (Dec.) 1939. Partial Index

Treatment of Detachment of Retina by Electrolysis. H. Machemer.—p. 561.

*New Thoughts on Pathogenesis of Myopia. K. Lindner.—p. 582.

Cyclodiathermy Puncture in Glaucoma. A. Vogt.—p. 591.

Important and Simple Aid in Magnet Extraction of Splinter from Anterior Chamber. W. Comberg.—p. 600.

Fundus Oculi in Three Forms of Familial Idiocy. K. Schaffer.—p. 602.

Problem of Primary Gliomas of Optic Nerve. F. Wagner.—p. 606.

*Observations on So-Called Lactation Neuritis. M. Glees.—p. 615.

Pathogenesis of Myopia.—Lindner cites evidence which suggests that only that type of close work promotes myopia which involves an intense metabolism of the retina. Reading, with its continuous change of pictures, results in much greater metabolism than does looking at the same picture. The greater exertion of the visual organ is accompanied by a greater serous perfusion of the choroid. Watchmakers are almost never myopic; the pictures which they observe remain constant and the metabolism of the retina is consequently less intense than is the case in reading. Sewing likewise calls for less exertion of the retina than does reading and this explains the low percentage of myopia among seamstresses. To prevent myopia or arrest its progress, the work of the retina must be made as easy as possible. Even slight astigmatic defects should be carefully corrected; the best possible illumination should be provided; prolonged close work should be interrupted by frequent recesses, and venous stasis in the region of the head, such as is brought on by a bent-over posture, should be avoided.

So-Called Lactation Neuritis.—Glees reviews the symptomatology. He says that during the puerperium or shortly thereafter there may develop, accompanied by headaches, an impairment of the visual acuity of one or both eyes. Examination discloses optic neuritis, peripheral contractions of the visual field and central scotomas. Occasionally the bulbi are sensitive to pressure and the movements of the eyes may be painful. The disorder subsides in the course of weeks or months and the visual acuity is largely restored. Thus the prognosis is relatively favorable. The etiology is unknown. He reports three cases of lactation neuritis observed at his clinic during 1938. In the first case the disorder developed eleven weeks after delivery and five weeks after the child had been weaned. In the second case it appeared four weeks and in the third case six weeks after delivery; both of the women were still nursing their infants when the eye disorder developed. All cases were characterized by severe changes in the papilla and in two cases there existed vascular changes and retinal edema in the surroundings of the papilla and along the large vessels. In view of the fact that vascular changes, particularly contraction of the arteries, have been observed also by others who have studied lactation neuritis, the author concludes that vascular changes play a part in the pathogenesis of this optic neuritis. To be sure, this does not explain why they appear during the period of lactation. None of the hypotheses give a satisfactory explanation and the author regards a direct connection between the disease of the optic nerve and the lactation as doubtful. He accepts as most plausible that weakening of the organism by gestation, delivery and puerperium provide the basis for some infectious impairment of the optic nerve.

Röntgenpraxis, Leipzig

11: 611-650 (Nov.) 1939. Partial Index

*Roentgenologically Visible Calcifications of Cardiac Valves. D. Hoffmann.—p. 611.

Roentgen Therapy of Malignant Struma With and Without Operation. J. Haldrup.—p. 615.

Case of Obliquely Contracted Osteosynostotic Pelvis (Type Naegele) with Homolateral Osteomyelitic Defect of Neck of Femur. J. H. Müller.—p. 621.

Hodgkin's Disease of Bones. J. Grauer.—p. 623.

Various Breaks in Continuity of First Rib. W. Kohlbach.—p. 626.

Congenital Deformity of Lumbar Portion of Vertebral Column. F. Meves.—p. 628.

Roentgenologically Visible Calcifications of Cardiac Valves.—Hoffmann says that there are few records of roentgenologically visible cardiac calcifications. He describes his own observations in two cases. In the first, roentgenoscopy disclosed nothing abnormal on the lungs or the diaphragm. However, a dense shadow the size of an almond was observed

in the left half near the center of the heart. This shadow moved up and down and when the patient was turned the shadow could neither be separated from the heart nor even transferred into its periphery. Furthermore, inspiration did not change the position of the shadow. The regularly pulsating movement of the calcium shadow was considerably more extensive than that of the cardiac outline. During lateral exposure the shadow made an almost vertical elliptical rotation. The roentgenogram indicated that the shadow represents a calcification of the mitral valve. The roentgenologic diagnosis of calcification of the mitral valve was supported by the clinical examination, which indicated a mitral stenosis and insufficiency. An endocarditis during childhood is regarded by the author as the cause of the mitral calcification. In the second case a dancing calcium shadow the size of a bean led to a more thorough examination. In view of the position of the shadow and of its dancing movements, the author assumes a calcification of the aortic valve. He thinks that a calcification of the coronary arteries can be ruled out because the movement of the shadow was more extensive than that of the edge of the heart.

Strahlentherapie, Berlin

66: 369-544 (Nov. 30) 1939. Partial Index

Indications for Irradiation of Hypophysis, Thyroid and Adrenals.

A. Schittenhelm.—p. 373.

Significance of Heredity in Pathogenesis of Cancer. B. Fischer-Wasels.—p. 428.

Statistics on Carcinomas of Female Genitalia as Basis for Systematic Treatment of Cancer. W. Hagedorn.—p. 448.

Treatment of Glandular Metastases in Carcinoma of Lung. W. Pfeifer.—p. 468.

Possibility of Juxtatumoral or Intratumoral Ray Therapy. G. Kohlmann and L. Brat.—p. 474.

Specific Actions of Ultrashort Waves: Thermic, Athermic and Specific Action of Ultrashort Waves. M. Theis.—p. 494.

*Artificial General Irradiation with Ultraviolet Lamps in Cases of Tuberculosis of the Skin During Winter 1938-1939. W. Küllmer, L. Peukert and W. Schultze.—p. 515.

New Water Cooled Mercury Vapor Quartz Lamp for Contact Irradiations. H. Lüsebrink and L. Peukert.—p. 525.

General Irradiation in Cutaneous Tuberculosis.—Küllmer and his associates state that, at the Giessen sanatorium for patients with lupus, observations extending over twenty-five years have demonstrated that systematic and correctly apportioned heliotherapy is the most important factor in the successful treatment of cutaneous tuberculosis. Attempts were made to provide the lupus patients during the sunless periods with a substitute for sunlight. The authors describe the various types of therapeutic lamps that were used. It was their aim to determine what type of radiation was necessary to produce a certain biologic effect. They describe the method used for general irradiations of 150 patients during the winter 1938-1939. The long ultraviolet waves were of great value in the treatment of patients in whom the cutaneous tuberculosis is complicated by pulmonary lesions. They dispensed with the strong irritative action which the short ultraviolet rays exert on the skin. Their observations correspond with the fact that sun baths during the morning hours are better for patients with cutaneous tuberculosis than are sun baths when the sun stands highest, that is, when the wavelengths are shorter; furthermore, the favorable therapeutic results obtained during spring in the high mountains tend to add further proof. They are convinced that in cases of cutaneous tuberculosis the weakening of the short ultraviolet waves is advantageous. They hope that a type of radiation may be found that can be used in cases of active pulmonary processes.

Wiener klinische Wochenschrift, Vienna

52: 1133-1152 (Dec. 22) 1939

Mediastinitis. E. Wessely.—p. 1133.

*Treatment of Narcotic Poisoning. H. Kutschera-Aichberger.—p. 1135.

X-Ray Examination of Pulmonary Suppurations. J. von Palury.—p. 1137.

Surgical Intervention in Dermatologic Cosmetics and Transplantation. S. Tappeiner.—p. 1140.

Metrazol Therapy in Narcotic Poisoning.—According to Kutschera-Aichberger, victims of barbituric acid poisoning may die because the dosage of the drugs usually administered is insufficient to rouse them from their coma and thus allows post-narcotic pneumonia to develop. He was successful in forcing

comatose persons into consciousness by persistent administration of unusually high doses of from 5 to 10 cc. of metrazol in hourly intervals without inducing convulsions, though the total dosage was as high as 110 cc. within ten hours. In two cases reported from a larger number, the author was able to restore to consciousness and life two women, aged 37 and 31, who had attempted suicide by means of barbitol and illuminating gas, by injections of 10 cc. of metrazol given intravenously every hour. In the one case supplementary measures consisted of intramuscular injections of 10 cc. of metrazol, carbon dioxide inhalations (seven an hour) and a subcutaneous injection of physiologic solution of sodium chloride (2 liters). Nourishment was supplied by a nasal instillator in the form of sugar solution and black coffee. The author stresses the necessity of large doses of metrazol in intoxication from barbituric acid derivatives, the therapeutic value of carbon dioxide inhalation and the need of nourishing comatose patients who cannot be roused on the first day. He cautions against the use of high doses in cases of self poisoning by other means. Barbituric acid and its derivatives, he found, showed a tolerance of metrazol far exceeding the usual tolerance limit, without provoking spasms.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

106: 597-775 (Nov. 3) 1939. Partial Index

- Relations of Reticulo-Endothelium to Metabolism of Nonhemoglobin Iron. A. Vannotti and A. Imholz.—p. 597.
Experimental Investigations on Metabolic Actions of Caffeine. E. Danopoulos.—p. 612.
Carbohydrate Tolerance Test for Examination of Normal and Defective Carbohydrate Metabolism. (Addison's Disease, Acromegaly and Diabetes Mellitus.) G. Stötter.—p. 622.
*Physiologic Examinations and Observations on Persons Working in High Atmospheric Pressure (Caisson Workers). W. Marquardt and J. Rietz.—p. 684.
Postmortem Decomposition of Hepatic Glycogen Following Its Artificial Increase. H. Ziemke.—p. 704.
Influence of Riboflavin on Inhibition of Resorption of Carbohydrates by Phlorhizin. H. Robbers and O. Westenhoeffer.—p. 714.
Experimental Investigation on Hypochloremia of Hormonal Origin: Pathogenesis of So-Called Hypochloremic Azotemia. P. Larizza.—p. 719.
Allergic Pneumonia and Vitamin C. G. Walther.—p. 748.

Physiologic Observations on Caisson Workers.—Marquardt and Rietz observed caisson workers exposed to pressures of 3.75 atmospheres. They found that such pressures do not cause an increase in the basal metabolism during the time the worker is in the caisson or as the result of the daily work under such high atmospheric pressures. Observations on the pulmonary ventilation revealed a greatly increased respiratory volume with a simultaneous decrease in frequency and thereby corroborated the assumption of a deepened respiration during the time the worker is in the caisson. However, there was no increase in the vital capacity during the stay in the caisson or as the result of several months' work in it. Studies on the circulation during the stay under excess pressure revealed a decrease in the frequency of the pulsation in spite of hard physical labor. Simultaneously there existed a tendency toward decrease in blood pressure. Electrocardiographic records made while the workers were under excess pressure revealed a positional change of the heart in the form of a turn of the sagittal axis, a change that is indicative of a lowering of the diaphragm. There were no changes in the condition of the stimulus or in the contraction. Furthermore, caisson workers, even those who had done this type of work for years, were free from electrocardiographic changes. The red blood pictures of caisson workers revealed a tendency to a decrease in erythrocytic values during the stay in the caisson, but there were individual differences in the severity. Following a return to ordinary atmospheric pressure, normal erythrocytic values were found and there were no signs that anemia developed after daily work in the caisson. The refractometric blood protein values, which were determined in order to clarify the concentration of the blood, were increased under excess atmospheric pressure in the majority of cases. Thus there is no foundation for the assumption of a hydremia. The observed increases in the protein values were the result of the muscular exertion. The blood sedimentations show a normal course. The fluctuations in the sodium chloride and the bilirubin values likewise are within the limits of the physiologic norm during stay in the caisson.

Med. v. d. Dienst d. Volksgez. in Nederl.-Indië, Batavia

28: 283-420 (No. 4) 1939. Partial Index

- Composition of Diet of the Chinese in Batavia. L. W. J. Holleman, D. R. Koolhaas and J. A. Nijholt.—p. 306.
Epidemic Cholera in South Celebes Caused by *Vibrio El Tor*. C. E. de Moor.—p. 320.
Complement Fixation in Diagnosis of *Leptospirosis* in the Netherland East Indies. W. A. Collier and A. Mochtar.—p. 356.
Blood Grouping in Nias. J. H. Maasland.—p. 373.
Hyrceanus Problem in the Netherland East Indies, with Description of a Widespread Malaria Carrying Variety: *Anopheles Hyrcanus* X. W. G. Venhuis.—p. 376.
*Combined (Simultaneous) Immunization Against Tetanus. L. Otten and I. P. Hennemann.—p. 391.

Immunization Against Tetanus.—Otten and Hennemann cite investigations which show that the development of active immunity against tetanus is interfered with by a single as well as by a repeated serum injection and that immunity is not always detectable as late as from thirty-one to forty-one days after the first injection of formaldehyde toxoid. They decided to solve this problem experimentally by determining the antitoxic values during the first six weeks after the commencement of immunization. They tried eight different methods. They stress the following points: 1. As in immunization against diphtheria, the development of active immunity against tetanus by formaldehyde toxoid appears to be inhibited by the presence of a passive immunity. 2. Experimental research in guinea pigs proves that the third to the sixth week constitutes the critical period, the passive immunity becoming exhausted while active immunity has still not reached the required level. 3. With three injections of formaldehyde toxoid at ten day intervals, the first two followed by injection of serum after twenty-four hours, this gap can be bridged, the passive immunity passing into the active without interruption. 4. The inhibitory action of the passive immunity has to be attributed to the antitoxin itself, whether of heterologous or of homologous origin. 5. Apart from this specific factor, heterologous serum, by its foreign protein content, provides a nonspecific factor, either inhibiting directly or, on repeated administration, indirectly by interference of a protein antiprotein reaction. 6. As the course of the response to combined immunization in man has not been studied with sufficient accuracy up to now, this method should not be applied universally until a systematic research, pursued over the whole critical period of the third to the sixth week, has proved that the antitoxin can indeed be maintained continuously at a satisfactory level. 7. Even if this should appear practicable, systematic active immunization deserves recommendation for all occupations particularly exposed to the risks of tetanus infection and above all for military forces.

Acta Orthopaedica Scandinavica, Copenhagen

10: 221-402 (Nos. 3-4) 1939. Partial Index

- Arthrodesis of Shoulder Joint in Paralysis of Deltoid. G. Asplund.—p. 248.
Patellar Chondromalacia. H. Hinricsson.—p. 312.
*Relation Between Congenital Subluxation of Hip and Arthritis Deformans: Roentgenologic Study. G. Wiberg.—p. 351.
Renal Rickets. T. Gordh.—p. 376.

Atrophic Arthritis Secondary to Congenital Subluxation of Hip.—Wiberg explores roentgenologically the relation of congenital subluxation of the hip to the evolution of atrophic arthritis in eighteen cases in which x-ray examinations could be repeated in the course of from fifteen to thirty years. The successive film evidence for three of the cases is presented. According to the author, sclerosis in the roof of the socket seems to be the first sign of arthritis and appears before there are any demonstrable changes in the head, but after these have occurred subsequent changes are more rapid in this region. Destruction of the cartilage need not precede sclerosis. However, the author has observed no case in which there was pronounced cartilage destruction in the absence of sclerosis. The presence of a double floor in the socket cannot be established in all cases of subluxation. After the process of arthritis has set in, beak-formed osteophytes occasionally develop on the lateral margin of the roof but fail to offer structural support. Capital deposits seen in the film were always situated in the lower part of the head and appear in the film as parrot beaks. The resultant form of the head depends to the highest degree on its initial form.

